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A Monthly Review of Veterinary Science.

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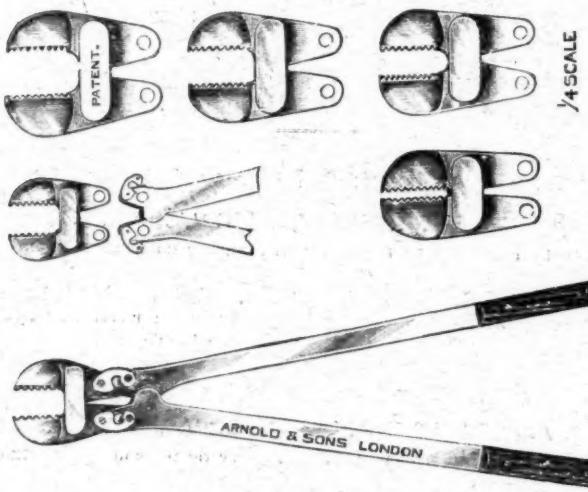

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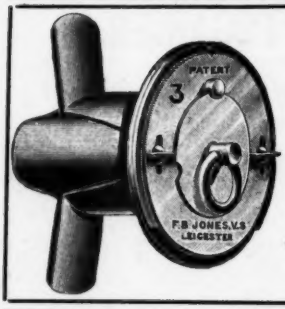

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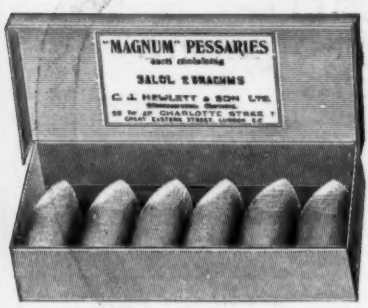

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THE

VETERINARY JOURNAL

FEBRUARY, 1912.

Editorial.

THE "OPINION" OF THE PROFESSIONAL WITNESS.

For a long time, in fact for many years, one of the London magistrates has taken upon himself to caustically criticize the evidence given by veterinary surgeons in the witness-box. On one occasion a statement came from the Bench to the effect that if the "whole Veterinary College" gave expert evidence against what was this learned magistrate's own opinion of the particular case then in front of him he would not believe them, but decide according to his own judgment.

Quite recently, again, we have a statement in the public press in which a gentleman, who is supposed to be administering justice with absolute fairness and impartiality, states: "From a long experience of veterinary evidence, I am fully expecting two veterinary surgeons to appear, one of whom will say, 'This is a horse,' and the other, 'No, it is not'; for that is about the only remaining thing for them to differ upon."

Were it not a sufficiently obvious fact, from daily observation of the police court columns of the newspapers, that the gentleman who made the statement is at times a humorist, and scarcely ever misses a chance of giving *his* opinion on all sorts and conditions of men (and women, too) who come before him, the statement might be taken really seriously; but, except for the fact that it scarcely seems right and manly that such remarks should be made by anyone whilst sitting in judgment, and whilst in a position which permits of no reply or retaliation, the words are so utterly nonsensical that, except for their source, they are beneath notice.

That veterinary experts will differ, in the same way that medical and other experts do, is to be expected, and such comments as the above ought never to be made. Unfortunately there are always men to be found in every profession who will give evidence as "near the line" as possible, merely for the sake of the fee attached to their presence in the witness-box, but that any magistrate should take advantage of his position, when in his official capacity, to make adverse comments upon the whole of the veterinary profession is unjust and ungentlemanly. He might as well say that a lawyer should never defend a client of whose innocence he has the slightest doubt. Magistrates, as a rule, know nothing whatever about horses (and still less about their diseases), and although every member of our profession would wish that when there is any room for doubt the decision should lean to the side of humanity, yet this may be carried to the point of fanaticism and injustice; and a horse owner, who has acted quite innocently, becomes branded with a black mark which is never forgotten by those who employ him.

The London Master Carmen and Cartage Contractors' Association, a body of men who comprise some of the most influential (as well as some of the smaller) employers of horse labour in London, have recognized this, and at the last meeting of the Council of the Royal College of Veterinary Surgeons sent a communication asking that they would lend their assistance to control certain magisterial decisions which, in their opinion, were due to the conflicting nature of the veterinary evidence. That the members of the College Council were in sympathy with them was shown by their reply, which was to the effect that "if the Association could supply details of any particular case in which injustice appeared to have been done, the Council would take such action as was legally possible." We look forward to the first test case of this kind, and congratulate the proposer of a motion "To discuss the unfair treatment meted out to the profession when giving expert evidence in the police courts," on the opportune moment which he has selected for bringing it before the members of the Central Veterinary Society.

General Articles.

BOTRIOMYCOSIS.

By Geo. H. WOOLDRIDGE, F.R.C.V.S., M.R.I.A.

Indexed B. A. L. *Professor in the Royal Veterinary College, London.*

This is a disease due to inoculation of an organism known as the Botriomyces, or the Discomyces. It affects horses principally, but it has been observed on rare occasions, according to Fröhner, in cattle, in swine, and the human being. The lesion produced is called a botriomycoma, and consists largely of a chronic inflammatory proliferation of connective tissue with suppurating foci. It is the result of a wound infection, and the wound may be an apparently insignificant one, as a scratch by some part of the harness such as the collar, as an operation wound, as in castration. The disease is comparatively common both in the British Isles and on the Continent. Fröhner records that he operated on not less than 400 cases in the years 1895—1903 in a surgical clinique of 8,000 diseased horses.* These included 175 shoulder tumours, 150 fistulæ of the spermatic cord, and 75 other forms of botriomycoma. These latter included cases in various parts of the skin, and in the udder of mares. Generalization occasionally occurs, but is comparatively rare. In the latter cases it has been recorded with secondary lesions in the lungs, spleen, liver, kidneys, and lymphatic glands. It is a sporadic affection occurring generally in isolated cases and showing little or no tendency to spread to other animals in the stable. Of course, if one affected animal is present, and pus containing the organisms is being discharged from the lesions, there is a chance of it being conveyed by harness and grooming utensils, and it might be spread in that way. But the development of the disease is so slow and insidious that the first case may almost be forgotten before the second one, affected from the first, shows appreciable lesions. It is so slow of development that horses castrated as yearlings and inoculated then frequently do not show symptoms of the disease until they are five or six years old, or even older. It is very rarely a fatal disease, except in those few cases of generalization, but horses affected are rendered unfit for work, either by interference with some part of the harness, or when the spermatic cord is the seat

* "General Veterinary Surgery." Fröhner, Udall's Trans., p. 161.

of the lesion by interference with the gait, and often producing lameness.

SYMPTOMS AND MACROSCOPIC CHARACTERS OF THE LESIONS.

As in actinomycosis, the symptoms are almost entirely limited to the lesions. The latter are apparently more wide-spread and more frequently discharging than in actinomycosis, but as the affection does not usually interfere with prehension or mastication the loss of condition is seldom so marked. The tumours may be single or multiple, and their size varies considerably. They may be the size of a pea, or as large as one's head, or even larger. Their common sites are in the front of the shoulder (shoulder tumour), spermatic cord (scirrhous cord), the point of the elbow (elbow tumour or shoe-ball inoculated as a complication), the stump of the tail after docking, and the udder, while the same causal organism has also been found in lesions of poll-evil, and sinuous withers. Wolstenholme records a case in which the lesions occurred at the lower posterior portion of the left thigh of a horse working in chain gears.* The position of the lesions suggested that the trace stretchers probably caused small wounds by which inoculation occurred.

The earliest condition as affecting the shoulder frequently consists of a large, painful, deep-seated swelling, not very dense, and not fluctuating. This may subside after local antiphlogistic treatment, but in most cases it reappears at a later date in the form of a dense cold tumour.

The name "mycofibroma," which is sometimes applied, fairly well indicates the common characters of the older lesions. The main substance of the new growth is dense fibrous connective tissue containing a varying number of suppurating foci, which are virtually abscesses. The skin over the enlargement may be seen to point and fluctuate and then burst, emitting a sticky kind of pus. The wound thus produced may then heal, and fresh abscesses form and repeat the process. Sometimes there are several openings all communicating with a purulent centre. When the shoulder is affected the lesions frequently extend into the levator humeri muscle, and sometimes they completely surround the jugular vein. When the spermatic cord is the seat of the lesion, the new growth may be right at the end of the cord and completely in the scrotal sac, while in some cases it extends up the cord into the inguinal canal. In these latter

* *Journal of Comparative Pathology and Therapeutics*, vol. xiv, p. 370.

instances one rarely realizes the extent of the condition and the difficulty of the surgical removal of the tumour until the patient is cast and a very thorough examination is made. The tumours are well supplied with vessels and are generally closely adherent by fibrous tissue to the walls of the scrotum. It is quite common for several fistulæ to run into the centre of them.

The pus from a botriomycoma is characteristic in its appearance to the naked eye. It is sticky, or mucoid, and if a little is spread on a slide a number of granules can be seen. Unlike the pus from actinomycomata, however, the granules do not give a gritty feel when rubbed between the thumb and fingers. These granules consist of colonies of the botriomyces or discomyces, of which more will be said later.

When any of the botriomycomata are cut into after the removal, they are found to be very dense and firm, almost tendinous in places, both as regards their hardness and their glistening appearance. In other parts they look quite watery, and often show areas of yellowish fat. One or more cavities and channels of varying size may be seen, some very minute and others fairly large, and each containing the characteristic pus with granules. It is probably unnecessary for me to assert at this point that one must not imagine for a moment that all scirrhous cords are due to the botriomyces. Any slow irritant may be responsible. One instance recently came under my observation in which I had applied a transfixing ligature on castrating on account of the varicose condition of the vessels of the spermatic cord. The scrotal wound was kept open intentionally for the escape of the ligature. The latter, however, was not thrown off as expected, and in two or three weeks it still remained and was obviously producing a fungating condition of the end of the cord. I accordingly cast the horse again, and found a well-established fibrous tumour about as big as one's fist developed around the ligature at the end of the cord. The growth was removed with the ecraseur, and afterwards recovery was unimpeded. In another case I removed a tumour 12 lb. weight from the spermatic cord of a pony. On microscopic examination the growth proved to be a myxo-fibroma, no organisms of any kind being demonstrable. Numerous other examples of scirrhous cord occur in which no organisms whatever are discoverable.

According to Fröhner, botriomycosis of the udder of the mare is not uncommon.* He says, "The udder is swollen, hard, shows

* "General Veterinary Surgery." Fröhner, Udall's Trans., p, 163.

nodular induration and fistulous opening, as well as circumscribed abscess formation. Typical botriomyces colonies may be recognized in the pus of the fistulous tracts." He quotes Unterhössel as having "described a botriomycotic neoplasm that weighed 35 kilograms, and was located on the udder of a mare."

Metastasis is not very common in botriomycosis, but cases have been recorded by M'Fadyean* with secondary lesions in the lungs and spleen, and by others in the liver and kidneys.

Microscopic Characters.

Microscopic examination of sections under a low-power reveal characters somewhat resembling those of actinomycosis. The mass of the growth is inflammatory fibrous tissue with areas of fat, and varying-sized areas, which stain deeply, containing the botriomyces granules and maybe some pus cells. These granules are best examined as obtained from pus. If one be squeezed between two thin slides and examined under a low power it will be seen to be almost opaque, and with an undulating margin as though made up of a number of smaller rounded bodies packed closely together. If these are still further broken up and stained either by methylene blue or the Gram method, they will be seen to be composed of considerable numbers of staphylococci held together by some amorphous matrix. There are no filaments and no clubs and therefore they should be easily distinguished from those of actinomycosis. The pus also contains grape-like bunches of cocci besides those of the granules. These micrococci are indistinguishable from the *Staphylococcus pyogenes aureus.*

Cultural Characters.

The organism will grow on any of the ordinary media. On potato and on agar it produces a yellowish growth. It liquefies gelatine, and the growth becomes deposited as a yellowish precipitate. In these respects the cultures closely resemble those of *S. pyogenes aureus*, but they are said not to be so deep in colour as the latter. On microscopic examination the cultivated organisms do not reveal the two forms as found in the pus. The granules or colonies are never met with in artificial media, nor during acute stages in experimental cases inoculated with cultures. If such cases become chronic, however, pus may eventually be discharged containing granules resembling those in naturally occurring cases.

* *Journal of Comparative Pathology and Therapeutics*, vol. xiii., 1900.

Treatment.

In the early painful condition affecting the shoulder, resolution may occasionally be brought about by the injection of fibrolysin or of tincture of iodine into the centre of the swelling, and the application of a smart biniodide of mercury blister. In these cases the internal administration of potassium iodide, or of mercuric-potassic iodide solution may be of service.

In the diffuse superficial form with multiple suppurating points treatment is difficult. I have had best results by inserting into the centre of each suppurating point once daily for several days the end of a grooved director which had been previously dipped in pure tincture of iodine. In this way the medicament gently gravitates into the lesion, and further injury to the tissue is avoided.

Whenever a botriomycoma is sufficiently well circumscribed to make excision possible, it should be operated upon. The internal administration of potassium iodide has been recommended in many quarters. In fact, this drug has been spoken of almost as a specific, as it is in so many cases of actinomycosis. My experience, however, fails to support that contention, and I think surgical measures should be resorted to as early as possible. It may be that potassium iodide is of service in those cases where the growths are so large or diffuse as to be inoperable. It may reduce them to an operable condition. The dose I have usually given has been two drachms daily or twice daily, and it is just possible that if the dose were doubled better results might be obtained. Fröhner, Malcolm and others have met with similar failures, while Thomassen, Seigmund, Ostertag and others have reported favourably of potassium iodide. In the surgical removal of botriomycomata there is usually considerable hæmorrhage and it is advisable to practise ligation pretty freely. I have often heard it said that all that is required is to cut off a portion of the growth, thus exposing the deeper cavities, and that the remaining growth will disappear. I strongly disagree with that practice. Although occasionally it may prove successful, it will much more frequently result in recurrence. I can recall a number of instances in which I have had to operate for botriomycoma of the spermatic cord after it had been previously treated by partial excision. There is really very little likelihood of recurrence if the obvious limits of the growth are removed. As a general wound dressing in these cases I prefer to use solutions of iodine (½ to 1 per cent.).

With regard to botriomycoma of the udder, Fröhner says that in his experience it is a very malignant tumour, and that operative removal is liable to be followed by recurrence.* For this reason he recommends total amputation of the udder, even where the disease is confined to one-half of it.

THE TREATMENT OF REDWATER IN CATTLE WITH TRYPANBLUE.†

By Dr. ARNOLD THEILER, C.M.G.
Acting Director of Veterinary Research, Pretoria.

I.

In the year 1909 Professor Nuttall, of Cambridge, in conjunction with Mr. Hadwen, published in *Parasitology* a paper on "The Successful Drug Treatment of Canine Piroplasmosis, together with observations upon the effect of drugs on Piroplasma Canis."‡ The authors stated that trypanblue and trypanred are highly efficient remedies in the treatment of canine piroplasmosis, exerting a direct and observable effect upon the parasites and causing the temporary disappearance of the parasite from microscopic observation in the peripheral blood. The efficacy of the new treatment was soon afterwards tested in South Africa by Mr. Jowett in Cape Town, who used one of the drugs—trypanblue—and was in a position to corroborate the statement of the two discoverers. At the Bacteriological Institute at Onderstepoort Dr. K. F. Meyer undertook the testing of trypanred on dogs artificially infected with the disease, but found that this drug was not so effective as expected. Botelho, working at the same institute with trypanblue, also obtained very satisfactory results. Ever since the first publications concerning the efficacy of the new treatment were circulated in South Africa trypanblue has been applied throughout the sub-continent, both by veterinary surgeons and laymen, on a very extensive scale, and there is at present a unanimous consent that the trypanblue treatment is undoubtedly a specific for biliary fever of dogs, and in most instances is attended by good results.

In the same year (1909) Nuttall and Hadwen undertook some experiments in order to study the effect of the drug treatment

* "General Veterinary Surgery." Fröhner, Udall's Trans., p. 163.
† From the *Agricultural Journal for the Union of South Africa.*
‡ See Veterinary Journal,, April, 1910.

on cattle suffering from bovine piroplasmosis.* These experiments refer to cattle inoculated with South African redwater, the virus of which I had sent to London in the year 1904 by means of blue ticks collected off a calf at a time when it showed the piroplasms in its blood. In London Mr. Stockman passed the strain of redwater through a number of animals, and this particular strain has served for the immunization of a considerable number of English cattle destined for exportation to South and East Africa. With this strain Nuttall and Hadwen inoculated nine animals, using 30 c.c. of virulent blood, four to act as controls and five to be submitted to treatment. The treatment consisted in an injection of 130 to 200 c.c. of a saturated watery (cold) solution of trypanblue, with which four cows were injected, into the jugular vein and one subcutaneously. Of the four control animals, two showed hæmoglobinuria (redwater), of which one died. Accordingly the virulency of the redwater strain was demonstrated. Of the treated animals, all five showed hæmoglobinuria (redwater), which appeared in four on the day the animals were treated, but before the injection of the drug. In one cow the red urine was noticed twenty-four hours after the injection of the drug. The duration of the passage of red urine lasted in these five cases twelve, twenty-four, thirty-six, forty-eight hours, and five days respectively. All five animals recovered. Of the treated cows the trypanblue was injected in one instance on the same day when the parasites were first noticed in the blood; in two instances one day later, and in two instances two days later. The striking result was that the parasites disappeared from the blood-stream for the next four days, and were found only in scanty numbers after some days had elapsed, or were even not found at all.

Accordingly, Nuttall and Hadwen rightly drew the conclusion that trypanblue promised to be an efficient remedy for bovine piroplasmosis, and that the drug produces no ill-effects upon cattle.

In the same year Stewart Stockman published his results of the new drug treatment for redwater in cattle. In one series of experiments, comprising twenty-one animals, seventeen were treated and four acted as controls. Of the seventeen animals, fourteen were either on the point of passing red urine, had just

* See VETERINARY JOURNAL, January, 1910.

begun to pass it, or had been passing it only for a short time before the trypanblue was injected; in the other case the treatment was started twenty-four hours before red urine appeared. Accordingly, Stockman's cases would refer to what can be clinically diagnosed by every farmer as "proper redwater." Of the untreated control animals none had shown red urine, and these animals were not treated because they did not develop severe symptoms. Red urine was voided for one day in one case, for two days in five cases, for three days in three cases, for four days in two cases, and for five, six, and eight days respectively in three other cases. Stockman also recorded the fact of an early disappearance of the parasites from the red cells in the peripheral blood. In thirteen of his cases he noticed subsequently blood lesions indicated by the presence of basophile and nucleated cells. None of the animals died. In another series of experiments with three animals, Stockman decided to inject the trypanblue at the beginning of the reaction. Two of the treated animals had not shown piroplasms before the drug was injected. None of these animals showed redwater. In these two animals the piroplasms were not seen at the usual time after inoculation, but appeared later and in rare numbers; the blood lesions were only noticed in one of the two animals.

This last experiment is particularly interesting, as it shows again that the treatment does not completely clear the piroplasms out of the system. Stockman's experiments support the conclusion of Nuttall and Hadwen that trypanblue has a marked effect on bovine piroplasmosis (redwater). He thinks that trypanblue may be made use of with advantage in connection with the immunization of cattle against redwater in order to control the reactions and to render the process of immunization more regularly mild.

II.

To these records, the details of which are of great importance, I am in the position to add some of my own which will support the favourable opinion so far expressed of the value of trypanblue in the treatment of redwater.

My cases refer to redwater in imported English cattle, produced in the majority of cases by the inoculation of virulent blood for the purpose of conveying an attack of redwater to the sus-

ceptible animal and thereby rendering it immune. One case refers to natural infection brought on by the infection with blue ticks.

(1) *Sussex Heifer*, 936.—18 months old. Injected on January 28, 1910, with 10 c.c. fresh blood of calf 905 immune to redwater and whose blood contained a virulent infection. On the seventh day a slight rise in temperature took place to 103° F.; on the next day the morning temperature reached 102° F.; the blood was examined and one pair of *P. bigeminum* was found. On the ninth day the morning temperature reached 104° F., and the piroplasms were found to be fairly frequent, infecting 2-4 per cent. of red corpuscles. In the course of the ninth day the heifer was injected with 90 c.c. of a 1 per cent. solution of trypanblue. On the same evening the temperature reached 103° F., and remained at that figure during the following day (tenth day). On the eleventh day it dropped to 101.2° F. in the morning, and continued practically normal for the next few days. On the tenth day all parasites had disappeared and were not found subsequently; no blood lesions were noted.

(2) *Sussex Heifer* 1211.—2 years old. Was injected on April 20 with 5 c.c. defibrinated blood from an immune Sussex heifer which had recently recovered from an attack of redwater produced by inoculation. A slight rise began on the seventh day, reaching 103° F. the same evening. *P. bigeminum* was frequently found. The morning temperature on the following day reached 104° F., and the piroplasms were numerous. The animal was also visibly sick, refusing to feed, and black urine was voided. The same day 200 c.c. of a 1 per cent. solution of trypanblue was injected; in the evening the temperature rose to 106° F. and dropped to 103.4° F. the next morning. The temperature remained at that record during the evening and descended to 102° F. the next day, from which date an almost normal course ensued. The urine was still red the day after injection. Blood lesions in the form of polychromatic and basophile cells were noted in this case.

(3) *Sussex Heifer*, 1212.—Injected with a similar quantity of blood as heifer 1211 (see No. 2), and for the same purpose. The evening temperature rose on the fifth day to 105° F., and on the sixth day to 105.6° F. On examination of the blood a few parasites were found. The temperature remained high on the seventh day, and the parasites had increased in numbers. The animal did not feed very well, and was visibly ill. On the eighth day the fever remained at the same height, and the parasites were still present in numbers. A subcutaneous injection of 200 c.c. of a 1 per cent. solution of trypanblue was now made. The same evening the temperature rose to 106° F. to drop to 103° F. the next morning (the ninth day). It continued to descend during the next two days, and reached normal on the eleventh day. The day after the injection of the drug all parasites had disappeared; after a prolonged search two *P. bigeminum*

were seen on the eighteenth day. Slight blood lesions in the form of anisocytosis, polychromasia, and basophilia were noted on the eleventh day, but they disappeared within a week.

(4) *Sussex Heifer*, 1219.—Injected similarly to heifers 1211 and 1212, and for the same purpose. The temperature reaction started on the sixth day, reaching 103° F. in the evening. *P. bigeminum* was noted on the seventh day. The fever rose to 104° F. in the morning of the eighth day, and the parasites were numerous in the blood; the urine was noted to be almost black on this date. During the day the heifer was injected with 200 c.c. of a 1 per cent. solution of trypanblue. The same evening the fever reached 105° F.; during the night it dropped to 102° F., and returned to normal the following day (ninth day). The urine began to clear the day after the injection of trypanblue. In the course of the succeeding week slight blood lesions were found (anisocytosis, poikilocytosis, polychromasia, and basophilia).

(5) *Sussex Heifer*, 1214.—Injected similarly to heifers 1211, 1212, 1219, and for the same purpose. A slight rise of temperature to 103° F. took place on the sixth day. On the same day *P. bigeminum* was found in the blood. The fever rose to 104° F. on the seventh day, and parasites were present in the blood in fair numbers. On the morning of the eighth day the temperature rose to 105° F., and the microscopical examination of the blood revealed the presence of parasites in extremely large numbers, almost every corpuscle containing one or more parasites. The animal was very ill, and the urine was dark red. On the same day she was injected with 200 c.c. of a 1 per cent. solution of trypanblue; the same evening the temperature rose to 106.4° F. and dropped subnormally over night, the animal having entered into a state of collapse; it died the same day. The examination of the blood proved the complete disappearance of all parasites, but the red corpuscles showed the lesions of a grave anæmia being distorted and destroyed to a great extent.

Post-mortem Report.—The condition was very good. *Rigor mortis* had not completely set in at the time when the *post-mortem* was made. The flesh had a very pale appearance, and the fat deposits were white. In the subcutaneous connective tissue of the shoulder were two large patches of blue infiltrations due to the injection of the trypanblue. The lungs had not collapsed and were normal, with the exception of a hæmorrhagic infarct in the right anterior lobe, reaching the size of an apple, and a consolidated œdematous focus in the left middle lobe. The trachea had a blue-greenish tinge (blue stain). The mediastinal and bronchial glands were normal. The heart contained blood-clots in both ventricles, which had a brownish hue; the epicardium showed ecchymoses; the endocardium had a blue-greenish tinge and a suffusion was found in the musculis papillaris of the left ventricle. The liver was slightly enlarged and of a light brown colour; on section it was yellow in colour, had a granulated appearance, and the parenchyma was somewhat friable. The gall bladder contained viscid bile of a brown colour. The spleen was enlarged. It measured 54 cm. in length (21½ in.), and in

breadth 15 cm. (6 in.); its weight was 1.76 kilo (3 lb. 2 oz.). The capsule was distended, the pulp was protruding and of a jam-like consistence; the trabeculæ were not distinct. The fourth stomach contained only liquid. The folds were swollen, the mucosa was pale and had a greenish tinge; in the pyloric part were some hæmorrhagic ulcers. The reticulum was attached to the diaphragm by a connective tissue which, on section, was found to contain an abscess caused by a piece of wire. The omasum contained dry blood. The serosa of all intestines had a blue-greenish tinge. The mucosa of the duodenum and the ileum was slate-coloured and covered with a mucous deposit. The mucosa of the cæcum and colon was slate-coloured and showed longitudinal hæmorrhagic streaks. The kidneys were almost black in colour, œdematous, and friable. The capsule was easily detached.

Remarks.—This *post-mortem* examination revealed the presence of very extensive lesions, and the conclusion is justified that the application of the trypanblue was practically too late. Notwithstanding the disappearance of all parasites, the lesions produced were of such a nature that recovery was impossible. It is remarkable how almost all the internal organs, particularly the serous membranes, were stained by the drug.

(6) *Sussex Heifer*, 1215.—Injected as heifers 1211, 1212, 1219, and 1214, and for the same purpose. The first rise of temperature took place on the fifth day to 104.6° F. *P. bigeminum* was observed the next morning. The parasites were frequent on the eighth day, when the morning temperature was 104° F. On this day the animal was injected subcutaneously with 200 c.c. of a 1 per cent. solution of trypanblue. The temperature rose on the same evening to 105° F., and reached 104° F. the next morning, 103° F. the same evening, and returned to normal within forty-eight hours after injection. The examination of the blood proved the disappearance of all parasites. In the course of the following days slight alterations of the blood corpuscles were noted. Rare parasites were seen again about three weeks later.

(7) *Sussex Heifer*, 1217.—Injected as heifers 1211, 1212, 1219, and 1214, and for the same purpose. The first rise of temperature took place on the sixth day to 104° F. in the evening, but no parasites were noted on that date. The following two days the fever maintained about the same height, and parasites were met with very frequently. On the eighth day dark urine was voided. The animal was now treated by the injection of 200 c.c. of a 1 per cent. solution of trypanblue, injected subcutaneously. The same evening the temperature rose to 106° F.; it dropped over night to 101° F., indicative of a collapse, but continued within normal limits. The animal, although showing symptoms of distress, soon rallied again. The examination of the blood showed the absence of all parasites. Within the subsequent few days slight blood lesions were noted.

(8) *Sussex Heifer*, 1218.—Injected as heifers 1211, 1212, 1219, and 1214, and for the same purpose. From the sixth day the

fever rose, but never surpassed 104° F. in the evening. The parasites were fairly frequent on the eighth day, when the animal was injected with 200 c.c. of a 1 per cent. solution of trypanblue. In this instance the temperature did not rise higher after the injection, but remained stationary at 104° F. for the next day, to drop to normal after that date. On examination of the blood the day after the injection of the drug one single parasite was noticed in the slide. No blood lesions were noticed in this instance.

(9) *Sussex Heifer*, 932.—Injected as heifers 1211, 1219, &c., and for the same purpose. A slight rise of temperature occurred on the sixth and seventh days. *P. bigeminum* was noted on the seventh day. In the morning of the eighth day the temperature reached 104° F., and the parasites were fairly frequently met with. The animal was now injected with 200 c.c. of a 1 per cent. solution of trypanblue. The temperature on that night rose to 105.4° F., to descend the next day, and reached normal limits within twenty-four hours. On examination of the blood the day after injection one single parasite was seen in the slide. Slight alterations of the blood were noticed, and about fourteen days later a recrudescence of parasites occurred, followed by a slight fever. The animal was not treated, and outwardly showed no signs of illness.

(10) *Sussex Heifer*, 940.—This heifer was infested with a considerable number of blue larval ticks, which readily attached themselves and developed in due course. On the fifteenth day after infestation the temperature rose and remained between 103° F. and 104° F. on the sixteenth and seventeenth days. On the eighteenth day the morning temperature reached 105° F. The animal was not feeding well on this day; there were, however, only a few parasites in the blood. The same evening the temperature rose to 105.6° F., and to 106° F. on the morning of the eighteenth day, when piroplasms were more frequently met with. The heifer was now injected with 100 c.c. of a 1 per cent. solution of trypanblue subcutaneously and 50 c.c. into the jugular vein. The evening temperature dropped below 106.2° F. and continued to descend the next day, falling to 100° F. on the twenty-first day; normal records were given after that date. Although no red urine was noted, the animal was decidedly ill for a few days and refused all food. She started to feed again on the twenty-third day, and commenced to ruminate on the twenty-fourth day, from which date a rapid improvement took place. For two days after the injection of the drug the parasites could be noticed in blood-smears, but only in rare numbers. The blood lesions were not so marked as one would expect from the ill state of health the animal was in for a few days, but they were nevertheless well pronounced.

(11) *Hereford Heifer*, 1179.—Injected subcutaneously with 5 c.c. of blood from an English heifer immune to a pure strain of South African redwater. The fever reaction started on the ninth day, ascending to 105° F. on the thirteenth day. The parasites were noted for the first time on the eleventh day; on

the twelfth day they had increased in considerable numbers, and were very frequent on the thirteenth day. It was for this reason that the heifer was then injected with 100 c.c. of a 1 per cent. solution of trypanblue. The same evening the temperature remained stationary at 105° F. The next morning—the fourteenth day—the temperature was still high, but dropped to 102° F. twenty-four hours later, reaching normal after another day. The day after the injection the parasites had disappeared. There were but few blood lesions noted subsequently.

(12) *Hereford Heifer*, 1182.—This heifer was injected in a similar way to 1179, and for the same purpose. The fever reaction commenced on the ninth day, and rose to over 105° F. on the eleventh day. On this date *P. bigeminum* was noted. This fact and the high temperature called for the injection of trypanblue (100 c.c. of a 1 per cent. solution). The next day the temperature had passed 106.4° F. in the morning. It descended the same evening below 105° F. and continued to fall, and reached normal on the fourteenth day. The day after the injection the animal was looking dull and was not feeding well. The examination of the blood was made, and showed the complete disappearance of the parasites from the blood-stream. The animal soon rallied. Only a few blood lesions were noticed subsequently.

Summary of Conclusions.

The experiments of Nuttall and Hadwen, as well as those of Stockman, are of particular interest to us because they were carried out with a South African strain of redwater. Further, I wish to emphasize the fact that English cattle were exclusively used in all the experiments, both in England and South Africa, and amongst these were those treated by Stockman and myself of selected breeding stock. It is true that these animals were comparatively young (between one and two years old), a fact which is of importance, as younger animals withstand a redwater reaction much easier than older ones. The observations here, however, prove that some of these animals underwent very sharp reactions. Every South African farmer who has ever imported stock from England knows the susceptibility of such stock to our redwater, and has experienced losses from this cause. Accordingly, it can be concluded that the drug treatment in the form of the injection of trypanblue has given satisfactory results. Of thirty-seven animals treated in London and Pretoria one died, and in this case the severity of the *post-mortem* lesions indicated that the treatment was apparently applied too late.

Amongst the thirty-six surviving animals twenty-five had shown red urine, a symptom which is generally considered to be a serious one, and undoubtedly indicates a grave state of affairs. It is furthermore noted that the injection of the drug in the majority of cases is followed by an immediate increase of fever, which is probably due to the destruction of the parasites and the liberation of toxins in the blood plasma. But within twenty-four to forty-eight hours the temperature returned to normal, and continued so subsequently. There was occasionally a re-appearance of blood parasites, but only in rare numbers, indicating that the drug has not destroyed all parasites, but in no instance did these parasites lead to a relapse of the disease. This fact is of the utmost practical importance. We know that redwater is a disease, the parasite of which remains in the blood after an animal has recovered from a natural attack, and it has been found that when the parasites have finally disappeared the animal is liable to a reinfection. Accordingly, since trypanblue does not kill the parasites in the blood, a lasting immunity must result. This was borne out by experiments. Most of the heifers treated by Stockman and by myself were later exposed to tick, viz., veld, infection, and all of them have proved to be immune. Accordingly, in trypanblue we have a useful drug, which will enable us to control and reduce the danger resulting from the artificial immunization of imported cattle against redwater, and, like Stockman, I consider that herein lies the advantage of the drug treatment. When, under the condition of the practice, a farmer notices an animal to be suffering from redwater, we may safely say that, in a great many cases, an interference comes too late. The one case of mine produced by tick infestation indicates that a speedy interference will lead to recovery, but very few animals would be under such close observation, and even my heifer, notwithstanding the immediate application of the drug, was very ill.

A warning must be given here, the neglect of which might lead to serious losses. For the purpose of obtaining blood to produce redwater in a susceptible animal, an immune animal is necessary. It is true that, in redwater infected areas, almost every bovine born and bred there contains *P. bigeminum*, and the injection of such blood invariably brings on redwater in susceptible animals; but such animals, in the majority of cases,

contain other parasites, one of which, described by me as *Anaplasma marginale* and considered to be the cause of gall-sickness in imported cattle, does as much, if not more, harm than *P. bigeminum*, and cannot be successfully dealt with by the trypanblue treatment. Indeed, in my first experiment I noticed a mortality of 50 per cent. in the imported cattle.

Accordingly, care must be taken to exclude this second parasite. This, however, is not work for a farmer, as much technical knowledge is required. We have arranged that imported animals with a pure infection of *P. bigeminum, i.e.*, redwater, are kept in the premises at Onderstepoort Laboratories, and arrangements will be made to stable others at the Grahamstown Laboratory, from which places pure blood for the injection of imported cattle can be obtained. How to overcome the difficulty of the anaplasmosis, or the gall-sickness, will be dealt with in a future article. Generally speaking, the drug treatment should be made use of in all cases of redwater; there is no other treatment which will give equally good results. The one disadvantage of the treatment lies in the fact that on the site of the infection frequently an abscess is found, succeeded by sloughing of the skin. The injection is succeeded by a blue-greenish discoloration of the skin, which will gradually disappear. Since, in South Africa, cattle dying from any disease are excluded from human consumption, nothing stands in the way of the use of trypanblue. To judge from our experience it did not matter much for the native.

In order to minimize all risks, it is advisable to boil the water and use it after cooling before the solution of trypanblue is made. For every 100 c.c. of water, 1 grm. of crystals is dissolved (15 gr. = 1 grm., 28 c.c. = 1 oz.). About 100 to 200 c.c. of this solution should be injected according to the size of the animal. The medicine causes apparently no harm. In severe cases an intrajugular injection may be indicated, which should be carried out by injecting the liquid under slight pressure into the vein. Similar to all surgical operations, care is necessary, and accordingly the syringe should be properly sterilized, and also the site of injection should be cleansed and disinfected.

[Some of our readers may not know of the use of trypanblue for the treatment of biliary fever in dogs, and for their information it may be stated that the same drug in the same concentration is used for subcutaneous injection. The dose varies between 5 to 15 c.c. for small and large dogs respectively. One injection as a rule suffices.]

ROARING AND THE NEW OPERATION.*

By Professor ATTILIO ANTONINI, Med. Vet. Surg.
Turin.

The lecturer's opening remarks were as follows:—

"There could not be a more propitious occasion than this for me to discuss a new operation that is being performed for the relief of roaring, and I am gladly taking this opportunity in the certainty of doing that which will be appreciated by you who are here assembled not only to consider those matters which are connected with the moral and material betterment of our profession, but also to investigate whatever relates to the scientific advances which are being made daily in our field of operations.

"Having regard to the importance and the number of subjects which have to be dealt with at this Congress, I shall try to be as brief as possible, and, resisting the attractions of the many questions which gather round the matter, I will limit myself to the consideration of well-established facts."

The speaker then touched on the history of the various attempts that have been made to cure paralytic roaring—from the various experimental, and more or less unsuccessful, operations of the two Günthers, of Hanover, in the first half of last century, through the identical or slightly modified efforts of Möller, Fleming, Stockefleth, Cadiot, and in Italy of the venerated Professor Bassi, up to the origination of "a really efficacious and sufficiently simple method by Professor Williams, of the United States, to whom should be accorded the honour of having solved the problem of a practicable technique, which has, indeed, been carried into actual practice in America and England."

After explaining that the method of Professor Williams "consists in the obliteration of the laryngeal ventricles," the lecturer, quoting Drouin, deprecated certain incorrect and unfair assumptions that Williams had only imitated Günther; and asserted that, although, no doubt, much was due to the previous but somewhat discouraging attempts of Günther, "the operating processes are quite different," and that "Williams has initiated a definite operation that deserves to be known by his name."

The lecturer then said: "This conquest of veterinary science

* Address given before the National Veterinary Congress, held at Turin on September 14, 15, and 16, 1911. Translated and condensed by I. S. C.

was first taken advantage of in Europe by Professor Hobday, who, desirous of practising the new operation, invited Professor Williams to come to England to teach it to him."

The invitation was accepted and Professor Williams demonstrated the technique of his operation to Professor Hobday and other English veterinarians, with such favourable results that "the operation thenceforth began to be practised in England. Professor Hobday, already noted for his surgical daring, operated upon 250 horses in the course of fifteen months."

"It is obvious," remarked the lecturer, "that the operations could never have mounted up to such a number unless Professor Hobday had been able to prove the efficacy of his adopted process." "In equine circles nothing else is talked of but this operation; both scientific and sporting journals are interested in it from the most varied points of view. Tracheotomy has received its death-blow, so much so that makers of tracheotomy tubes, seeing this source of profit in danger, find it necessary to resort to reinforced advertisements which declare that roaring can be cured much more rapidly through the use of their instruments than through the new operation. This new surgical triumph has not only created a sensation in England, but from Scotland, Ireland, Belgium, Holland, and France Professor Hobday is being called to perform the operation; and to crown all, the Russian Government has sent four stallions of the race of Orloff to be operated upon in England. Hobday's successes having obtained for him a European reputation, several veterinarians from the across the Channel have hastened to him for instruction.

"Amidst the enthusiasts critics have not been absent, but these have been obliged to give way before the evidence of facts, and now there are left but a few, and these continue to discuss the old question of priority in the discovery. Certainly no operation has ever before raised such a commotion, but Professor Hobday remains unmoved—by applause or criticism—and declares he 'intends to wait two more years before asserting the absolute value of the operation, but that his numerous investigations lead him to believe that the operation is really worthy of the highest consideration.'"

In the opinion of the Italian Professor, "it would be impossible to be more modest and prudent than this." After

referring to Professor Hobday's publications regarding his own modifications of Professor Williams's operating process, and after detailing and commenting upon Professor Hobday's experiences and statistics as published in the VETERINARY JOURNAL, January, 1910, Dr. Antonini described the Williams operation as modified and practised by Hobday, with the approval of the former, and proceeded to give an account of his own eight operations as undertaken after his visit to England, where he was initiated into the process through the greatly appreciated courtesy and capable instruction of Professor Hobday, who operated many times in the presence and for the benefit of his grateful and enthusiastic Italian disciple. The latter, on his own showing, has only been partially successful, owing, as he said, to want of practice in the delicate art of removing enough but not too much of the ventricular mucosa. He continues, however, to increase his manipulatory skill by persistently exercising it on dead horses, and he is "confident of being able, in time, to execute the operation with the same ease and certainty with which Professor Hobday performs it."

Before concluding his address Dr. Antonini drew the attention of the Congress to the "*mechanism of laryngeal roaring*" as promulgated in the VETERINARY JOURNAL, May, 1911, by Professor Wooldridge, observing finally that "certainly this new interpretation that Professor Wooldridge has given to the *mechanism of roaring* has its attractions and merits to be confirmed experimentally, and I promise myself to undertake experiments with this object as soon as I can. After all I have had the honour of setting forth to you I feel myself entitled to conclude that the new operation for roaring is worthy of serious consideration by ourselves too, both on account of its sporting and commercial potentialities, and also because of the satisfaction it must give to all who are drawn towards attempting it, and I prophesy that my words will serve to incite other and worthier colleagues to contribute their quota to this new triumph of veterinary surgery, which shows, once again, that our art truly merits all the distinction and respect conferred upon it by our study and devotion, which amply justifies our resentment at any disparagement whatsoever. But to show that we ourselves know how to appreciate and honour our profession, I should like this Congress to offer a vote of thanks to Professor Williams.

who originated this new operation, and to Professor Hobday, who, with the greatest generosity and courtesy, welcomed me as an inquirer. It is owing to him that, through me, to-day, you have been able to acquire, however imperfectly, some notion of the nature and the value of this operation."

RECENT INVESTIGATIONS ON THE ETIOLOGY OF FOOT-AND-MOUTH DISEASE.*

Indexed B. A. I.

By J. SIEGEL.
Berlin.

In the year 1901 I had the opportunity of renewing my investigations into the origin of foot-and-mouth disease. With the support of the Prussian Minister of Agriculture I had the opportunity of making numerous blood examinations in freshly diseased animals on infected holdings. Intensive and often repeated microscopic work at preparations led to the result that little coccus-like forms could be regularly found in the blood at this stage of the disease. Since all attempts to cultivate these forms on dead nutritive media failed, I considered them to be protozoa, without sufficient ground, as I now confess. The fact that one was not able to cultivate these forms did not exclude them from being bacteria, but the interpretation of small globular structures, without the control of cultivation, is always a precarious one, for the piroplasms and actual protozoæ were considered to be cocci by their first discoverers. Anyhow, at that time I could justly describe the cocci, whose life history I have followed further, by the name of *Cytorrhyctes aphtharum* (see *Transactions* of the Imperial Prussian Academy of Science, 1905), but evidently, since the control of cultures was wanting, erroneous conceptions crept in. Even at that time I found, as I have done now, that the virus of foot-and-mouth disease could be transmitted to the rabbit. I let infected rabbits eat with cattle and witnessed feverish illness in the latter with exanthema in the mouth. Although these investigations were objective they were to a great extent accurate, although not acknowledged at the time, and I cannot blame myself if many proofs of their ultimate exactness failed and, above all, cultural experiments. Mistakes

* Communication made on November 25, 1911, to an assembly of Prussian Government Veterinary Surgeons. From the *Berliner Tierärzt. Woch.*

have been made by Löffler (1897), Tröster (1910), Betegk, Dorr (1911), in consequence of misunderstanding Abbé's reckoning that structures under 0.25 microns were not visible for our best microscopes, and that structures passing through the filter were invisible. This is not correct, for coloured structures of 0.04 of a micron are actually visible, and even uncoloured colloid molecules of 0.006 of a micron. This error has been perpetuated for about fifteen years, and has acted as an especial drag on foot-and-mouth disease investigation. What one could not see was evidently no longer looked for. The filtrability of a parasite actually signifies nothing in general in respect to its size. It is only of significance in that among the possible forms of a parasite some of very small size may occur. The generally occurring forms can even exhibit a quite considerable size, *e.g.*, the trypanosomes, whose filtrate, according to McNeal and Nory, is known to be virulent.

I knew of this theoretical error, and did not let it affect me in striving to find the organism of the disease, but kept the cultivation of the coccus chiefly in view. At the end of last year an extremely favourable situation arose for prosecuting investigations in this direction. One of the chief hindrances to further research had been that hitherto one had never been able to examine freshly-slaughtered animals in the stage of a quite early outbreak of the disease. Last year the slaughter of large transports of quite freshly-diseased animals in the disease court of the Berlin slaughterhouse increased very markedly, and I had numerous opportunities of prosecuting the investigations I had long desired to make. In this work I was loyally supported by Councillor Neuermann, of the Prussian Ministry of Agriculture, and I wish to express my most sincere thanks to him here and now for his ever helpful and effective support. I had the opportunity of obtaining, in a very large series of animals, absolutely fresh working material with no troublesome infection or contamination.

The results of my work, resumed again after a long interval, may be divided into three portions. First of all the "as good as finished" investigations on the occurrence and breeding of distinct cocci, mentioned by me in my previous work as being nearly related to pox, *i.e.*, vaccinia disease, and called cytorrhyctes; secondly, the possibility of carrying out inoculations with the

cultures obtained; and thirdly, experiments on immunization with weakened cocci. Both the latter points are in a stage of preliminary enquiry, and mature results arrived at already will lead to further extended experimental research.

It is already a known fact that the organisms of the acutely contagious disease are not found in great quantity in the blood during the whole duration of the complaint, but are there especially at the time of the development of the disease, in *stadium incrementi*. Such experiences have also been noticed in typhus, erysipelas, nagana, anthrax, pox, &c., and in this stage the organism is either especially easily seen or bred, or where the organism cannot yet be certainly proved, infection by the blood may be regularly and easily produced. If a bacterium occurs in great quantity in acute infectious diseases or after death, the suspicion is justifiable that it is not the specific organism, but arises through secondary invasion. Especially well-known in this connection are the cadaver bacilli of anthrax, and in many of the infectious diseases of man such a condition is found. For blood examination in the commencing stage I used fluid drawn from the vena jugularis with the canula, and took care not to use the first flowing blood. A danger of soiling through bacteria when penetrating the epidermis was almost totally avoided by clipping the hair and preparation of the skin: or in slaughtering the affected animal, after complete opening and preparation of the skin, blood was taken away through the heart wound. In smears thus obtained cocci of a distinct variety were regularly found either lying singly in somewhat large colonies, or in smaller and most minute forms as the finest mono- and diplococci in swarms.

Smaller forms lying singly could frequently be found in the blood, but on account of their extraordinarily small dimensions were very difficult to fix with the microscope, and then only with the best apochromatic lens, whilst the larger groups could also be seen by achromates. For such an examination I will likewise observe that a cross table and very much patience are needed even in the case of blood-smears, which are subsequently found to be very copiously infested with cocci. I have occasionally had to work for one to two hours before finding a little cluster. In other cases one has had better luck, and after a few minutes the cocci have been discovered. Such forms

are found most prevalent in the blood at the time of the highest fever, in cattle registering 40—41.5° C., but also during the first outbreak of the exanthema after decline of the fever useful results may be obtained. By continued examination over several days after the eruption of vesicles up to the seventh day one finds the cocci always becoming rarer, until finally, after the seventh day, no more can be seen. This state of the cocci, also *their most plentiful occurrence at the time of the pre-exanthematic fever*, and at a time also when the superficial covering of skin or mucous membrane is uninjured at any place in the animal body, and *the absence of these cocci* at a time when great areas of the skin of the mouth, of the tongue, feet, and the mucous membrane of the stomach are subject to the invasion of secondary cocci, *without anything further, uphold my view as to the etiological connection between the cocci found and foot-and-mouth disease.*

Dr. Nicolaus has shown that in three animals at the time of high fever these cocci could be plainly found in the blood of the jugular, when the owner of the animals would not yet believe that they were infected with foot-and-mouth disease. This fact, discovered by Dr. Nicolaus, is noteworthy, as it may have a practical bearing in the diagnosis of foot-and-mouth disease at a time when the exanthema gives no certain criterion for diagnosis. In the transport of suspected beasts veterinary police examination plays a very important and worthy part, and hence it does not appear advisable to leave out this method of diagnosis any longer when there is a suspicion of foot-and-mouth disease in animals affected with fever but not visibly diseased.

The technique of the microscopic examination of blood is carried out according to the known methods: on thin smears of quite fresh blood in order to avoid clothing fibres and punctæ as well as great prominence of blood platelets; staining for half a minute with 1 per cent. methylene blue or azure, or Löffler's solution, rinsing and drying; then immediate examination in cedar oil. As above stated a cross table is necessary if one does not want to seek in vain on many occasions. The cocci in this stain appear of a deep blue tinge even after the continuance of staining and rinsing more or less separated in their most minute forms. Weaker stains, *e.g.*, alcoholic azure

solution, show the diplococci and the smallest of all, single scarcely visible forms much better defined, whilst over-staining causes union of large structures into large colonies of giant cocci. May I throw out a word of warning against staining with colour mixtures—for instance, Giemsa's stain? I have employed this stain several years previously in the technique of blood examination for syphilis and foot-and-mouth disease, but I soon discarded it, because I convinced myself that it was absolutely useless for discovering the most minute structures since it always had to combat sediment, and besides stained every droplet of albumen in the serum and thus led to errors and confusion, which may be verified from examples quoted in the literature of the examination of vaccine and foot-and-mouth disease material.

The examination of lymph from the vesicles is not very satisfactory, because it may be contaminated by bacteria from the enveloping skin or that have wandered in from the neighbouring parts of the skin. The blood of animals in the initial fever, although not possessing such a high degree of infectivity as the lymph, is yet quite sufficient for the proof of the bacillus. Vesicular contents, as is now known from investigation of vaccines, are the most virulent if obtained from the vesicle at the commencement of its development.

Smears of the diluted contents of a vesicle—diluted because the great percentage of albuminous fluid forbids very thin smears—by staining with plain methylene-blue disclose a very large quantity of the most minute diffusely-scattered cocci. Single cocci display plain differences of form. I say expressly diffusely strewn cocci points, for such places in which one finds them in close or moderately close groups are always rather rare. But only the latter by strong magnifying furnish a useful photographic picture. Near a nucleus one finds a double structure with a plainly visible mucous halo, near other nuclei single cocci. One does not see grouping of the cocci into visible groups even under a weak power, as in pyogenic cocci staining, but a diffuse scattering permeating the smear is characteristic of the organisms of foot-and-mouth disease. As a rule one or two larger or smaller cocci conglomerates belong to each cell, consequently the name, cytorrhyctes cocci (Zellnager), has been temporarily used by me in contradistinction to the pyogenic variety. In many places one also finds diffusely strewn crowds

of the most minute cocci. Such photographic forms should not lead the investigator to believe that he is dealing with the parasite. In the material examined by me from strictly selected vesicles, I have hitherto found no other shapes of bacteria.

A third method which is peculiarly suitable for discovering the organism appears to me to be the examination of the diseased patches of the heart muscle. It is known, and during the last epidemic the point was closely studied (see Joest, *Zeitschrift für Hygiene der Haustiere*, 1911; Van der Sluis, *Tijdschrift voor Veeartsenijkunde*, 1911, 38 deel; Marcus, *ibid.*, and Büchli, *ibid.*), that in the heart muscle in malignant foot-and-mouth disease cellular infiltration occurs with destruction of muscle filbrillæ. This leads to sudden paralysis of the heart and death, and has been noticed to be especially frequent in Holland. The Dutch authors traced this change to the effect of the virus of foot-and-mouth disease, "which, deviating from the normal in the blood, must be present in a very concentrated state." (Bass.) This view was also supported by the earlier experiments of Nocard, who succeeded in producing positive inoculation with such changed muscle substance. Experiments with such tissue, quite freshly preserved, to discover the bacteria had hitherto failed. My own conviction was that if my result in examination of the blood was correct, naturally similar cocci must be found in the heart material. Useful material for such examinations was not easy to obtain. In Berlin useful examples did not come to my knowledge, and most hearts sent from away were more suitable for macroscopic demonstration and histological study, but freshly preserved material free from objection was only received on four occasions.

(To be continued.)

Indexed B. A. I.

CONTAGIOUS VAGINITIS IN COWS.*

By P. STAZZI.

Two years previously, the Lecturer had been commissioned by the Minister of the Interior to investigate and to report on this disease, which had been making a great stir in Italy as well as elsewhere.

Leaving for the official report all bacteriological and histological details, the speaker confined his remarks to some of the most important practical results of his researches and experiments. He said: Granular vaginitis was first notified thirty years ago by the Swiss veterinarian, Isepponi, of Coira, and thenceforward it was recognized in nearly every country of Europe. According to Williams, in his work on "Obstetrics," the disease has also become common in the United States of America. In Italy it is so widespread that many veterinarians and agriculturists have found it necessary to form themselves into unions for dealing with the alarming increase in this complaint.

Although some special variations have been recorded, the usual appearances of this affection are quite familiar and the streptococcus of vaginitis is sufficiently well known. It is only necessary to point out here that though it is always comparatively easy to conquer the open and acknowledged foe, there is a special danger of infection from the more obscure or doubtful cases, in many of which the characteristic vaginal follicular nodules are quite, or almost, absent, because the disease may have ascended and disappeared inwardly, the uterus itself being perhaps implicated.

Though it has been proved experimentally that the infectivity of this disease decreases in its advancing stages, and though in chronic cases infectivity is not always continuous, it should be remembered that it is subject to renewal through some process of recrudescence which may be amenable to clinical treatment.

Through all such considerations a false security can be avoided. Accurate diagnosis can only be obtained by a distrust of outward and visible signs alone; as, even in the absence of the specific symptoms, an animal may be seriously ill and highly infectious. Advanced vaginitis, frequently associated with

* Lecture given before the Society of Italian Agriculturists at Rome, June 29, 1911 Translated and condensed by I. S. C.

metritis, induces inflammation of the fallopian tubes and the ovaries.

Failure to induce infection of the uterus experimentally may be accounted for by the probability that uterine susceptibility to the virus is only present after parturition, when the mucous membrane is in a special condition of receptivity, and probably then only can the streptococcus be colonized, either alone or together with other bacilli, such as those of metritis, which malady appears not infrequently to be consequent on vaginitis. The latter must not be regarded as the sole cause of all uterine and ovarian inflammations, but undoubtedly where vaginitis prevails metritis is most frequent and either nymphomania in the cows or suppression or irregularities of œstrum most frequently show that ovarian metabolism has been thrown out of balance.

In heifers that had never calved, but which had been slaughtered at Milan because of their sterility, histological research had only revealed vestibular vaginitis; no complications had been discovered: uterus, tubes, ovaries were invariably normal; but several forms of parenchymatous metritis had been observed in cows of 4 or 5 years of age that had been mothers, although subsequent sterility had brought them also to the shambles.

When vaginitis is associated with metritis or any of its complications, such as salpingitis or ovaritis, the cause of sterility is obvious and the result is absolute, but it is only relative and should be curable when vestibular vaginitis alone is present. For such cases conception is not an impossibility, but a difficulty due probably to the hypersensitiveness of the vagina (vaginismus). The spasm of pain at coitus reacts internally on the reproductive organs and produces resistance to the entry of the spermatozoa, which therefore cannot reach and fertilize the ova. It has been found that conception can be secured through frequent covering after vaginal douching with a solution of carbonate of soda or of common salt, or even of sugar, and by subsequently giving the cow a good run in a field. Thus it may happen that, as the spermatozoa of the semen already in the vagina conserve their movements for some time (which is prolonged by the alkaline action of carbonate of soda), fertilization may be completed and the entrance into the mouth of the uterus may be effected when the above-mentioned resistant spasm shall have subsided; the actual organs of reproduction being presumably quite

sound at this stage of vaginitis. But in cases where its sequelæ, metritis, salpingitis, &c., have supervened and the uterus is diseased, sterility must be considered absolute and *economically* incurable. This disastrous spread of the disease may happen at any time through transmission of the virus by way of the lymphatics, but it certainly occurs more readily by direct transference of virus from the vagina into the uterus during œstrum, when the neck of the uterus is dilated, and most of all after parturition, when not only this dilatation is more persistent, but the uterus is in a particularly receptive condition. Varieties of endometritis would then ensue, the gravest symptoms of which are sterility and abortion.

The importance of vaginitis with regard to abortion has probably been exaggerated, for although a secondary uterine catarrh, due to specific infection of vaginitis, does destroy the intimate union between mother and fœtus so that the latter is expelled as a foreign body, a similar result is also produced by other causes, namely, deficiency in bulls, overfeeding, insufficient exercise, and by concomitant infections, such as those of tuberculosis and epizootic abortion.

By a process of comparative analysis, as pursued in England and Denmark, combined with a use of the diagnostic preparations of Professor Belfanti, it has been demonstrated that vaginitis is not responsible for abortions which occur after the fifth month of pregnancy and which assume an enzootic character, attacking from 20 to 30 per cent. of the cows during a few months. Such infection must be attributed to the bacillus identified by Bang; vaginitis, however, is suspected by this authority of predisposing cows to the infection of epizootic abortion. As this can be treated by means of specific remedies, from which much may be expected, accurate diagnostic distinction is very important, although the prophylactic measures are the same for both maladies.

Though, as Hess points out, vaginitis must not always and exclusively be held responsible for abortion and all disorders of the reproductive organs, these disorders are certainly most common where there is vaginitis, and there is no exaggeration in saying that the consequent sterility can and does cause the gravest losses to the breeding industry. To minimize these losses, strenuous efforts should be aimed at circumscribing

existing centres of contagion while preventing the formation of others. In Rome, the disease having been, so to speak, cornered, though the exigencies of trade are respected, it is comparatively easy to secure proper care and disinfection of affected animals before they are allowed to mix with healthy ones. Italy is fortunate in being able to profit by the prior experiences of those nations that first knew vaginitis. Although the disease abounds in Austria and Germany, these countries have not made its notification and isolation compulsory. Baden has been obliged to rescind its attempt at legislating in this direction, because, as Hafner reported to the German Veterinary Council, held at Breslau, no limitation of infection had resulted from these measures and proprietors had found them irksome and detrimental. Ostertag himself, to whom we owe our most precise knowledge of the etiology of the complaint, has, with Esser, declared that severe sanitary measures are useless because they are too late, the disease being already so widely diffused in Germany, just as it is throughout a great part of Italy. Though notification is compulsory in Italy, great administrative toleration is shown in dealing with vaginitis; much is made to depend on the extent of the malady and a certain liberty is allowed in the adoption of particular means of limiting infection. Still, it is felt that unnecessary hardship is inflicted by the Order of 1911, by which animals affected with vaginitis are either stopped at the frontier or slaughtered at the nearest shambles. Animals coming from Switzerland and Holland are, it is true, greatly subject to vaginitis, but they are destined for a country where it is equally prevalent. It should be possible, while insisting on notification, to deliver them to the buyers under obligatory conditions of proper therapeutic treatment, which presumably would be curative, as the animals would certainly be young.

It has been found in some provinces of Italy that subventions, such as are in vogue in Austria, induce proprietors to submit their animals to prophylactic measures as determined by veterinary experts, who have also to decide when cows must necessarily be slaughtered on account of metritis, &c. Curative treatment is not the only concern of a rational therapy of vaginitis; the reduction and removal of the virulent exudations must also be secured by locally washing the cows very frequently and the bulls before and after coitus, always using antiseptics, and

stalls must be disinfected weekly; the destruction of the specific streptococcus being continually kept in mind. It does not follow that the bactericides which are most potent in laboratory experiments are always the most effective in actual practice: Iodine, creosote, creolin, lysoform, phenic acid, in weak solutions (of 3 per cent.) all kill the streptococcus in a few minutes, but the less deadly sulphates of copper and of zinc have more therapeutic value. Sulphate of copper can be applied to the mucous membranes in the form of a cone. By this means the worst case of vaginitis can be cured in a few days. Probably this product causes first a recrudescence of the disease, which it then removes rapidly. But such direct application is impracticable in every case, especially where there are a number of heifers to be treated. It is difficult to touch the vagina on every part, especially the part near the neck of the uterus; for this reason solutions are more manageable as used for irrigations; in some animals, however, they set up irritation to the extent sometimes even of tenesmus, &c. All treatment is to be suspended during œstrum, and only very mild medicaments and non-irritant antiseptics can be used after the seventh month of pregnancy. In treating simple vaginitis it is safest to use medicated ointments and suppositories in which should be included some anodyne (such as ½ per cent. extract of belladonna) to allay the hypersensitiveness of vaginismus. Pomayer shows how infection can be carried from the vagina to the uterus through irrigations. After parturition, however, injections are indispensable. Dammann then considers the douche to be especially therapeutic and prophylactic. Moussu recommends the use of a weak solution of iodine (a teaspoonful in a quart of tepid water). This is always attended with the greatest success.

To sum up, everything resolves itself into a rational therapy, varying according to the different stages of the disease, with thorough disinfection of animals and their surroundings.

Breeders can protect themselves against the losses contingent on vaginitis by following the directions issued by the Bureau for the Study of Infectious Diseases in Cattle. The conclusions indicated in the foregoing lecture are practically synthesized in the authorized rules, as abbreviated below.

(1) Provide open pasturage for all cows, especially for those whose conception is tardy.

(2) Wash frequently the flanks, tails, and feet of cattle with soap and soda.

(3) Cleanse and disinfect weekly with boiling soapsuds or limewash all stalls, harness, &c.

(4) Disinfect the genital organs of bulls before and after coitus (2 per cent. solution of lysoform recommended).

(5) Treat heifers till cured according to veterinary advice, suspending the treatment during œstrum.

(6) Douche with 2 per cent. solution of carbonate of soda during œstrum, especially immediately before covering.

(7) After the seventh month of pregnancy use only the mildest of medicaments, such as ointments containing a very little belladonna and only 0.5 per cent. of a non-irritant antiseptic, lysoform, &c.

(8) Isolate or slaughter cows suffering from chronic metritis and those in whom œstrum has entirely ceased.

(9) After parturition inject weak solutions of iodine—a teaspoonful in each quart of tepid water.

Clinical Articles.

ACORN POISONING IN CATTLE.

By W. T. BROOKES, M.R.C.V.S.

Warwick.

Indexed B. & L.

During October I was called in to several lots of cattle in different districts suffering from acorn poisoning. The first lot of young cattle were taken ill on October 9, and consisted of nearly all heifers, Shorthorns and Herefords, about 18 months to 2 years old. Eight animals were affected. One of them died on October 14, and another on October 21. On this date the remaining six had recovered and commenced feeding again.

The second lot of young cattle were situated in another district altogether, and were all heifers. They were taken ill on October 16, and one was found dead on arrival. Eight other heifers were found to be suffering from undoubted acorn poisoning, and two of them were already *in extremis;* one of them died on the night of October 16, and the other on October 17. On October 18 three of the original eight were well, and three

fresh cases had occurred, making in all eleven cases. On October 21 the remaining eight heifers had all recovered.

Several other beasts in different parts have come under my notice, making thirty in all, nine of which have died. Most of the symptoms described in any text-book I have been able to refer to have been conspicuous by their absence. The chief things noticeable were the dull and depressed appearance of the animals, an entire absence of appetite and rumination, a weak, feeble pulse, subnormal temperature, and a disinclination to move about. Only one case in the first group and two in the second showed a mucous and blood-tinged discharge from the nostrils and anus. These all died, the first eight days after being seen, and the other two the day afterwards. An obstinate stoppage was noticeable in all the cases, and what little fæces were passed were inky black, stinking, and very thick. This impaction did not yield at all easily to treatment, and where a *post mortem* was made, the acorns were still present in the stomach.

In treatment, oleaginous and saline purgatives were given, combined with aloes Barb. in solution up to ʒviii, and croton oil. Alkalies, as soda and pot. carb. were given, as well as stimulants—nux vomica, ammon. carb., spt. æth. nit., and spt. ammon. aromat. Also linseed and oatmeal gruels. In one case a drench consisting of aloes Barb. ʒi in solution, croton oil 40 minims oleum lini. Oiss was given.

The *post-mortem* examination showed all these were more or less alike. The rumen contained an enormous quantity of pultaceous material—of gruel, and food which apparently was not able to pass on through the second and third stomachs, also corns and acorn husks. The mucous membrane was congested with numerous hæmorrhagic spots noticeable. The reticulum was normal. The omasum was somewhat empty, the contents of a pasty consistence. This organ had the appearance of being partially paralysed, was more or less collapsed, and seemed to act as a trap through which neither food nor gruel could pass. A patchy congestion was noticeable. The abomasum was intensely inflamed throughout. The spleen was normal in size, but had a curious congested appearance in sections. The small intestines showed occlusion of the bile duct, were not very full, and contained inky black fluid material. The mucous membrane was

more or less inflamed, and in some cases the contents of this bowel were blood tinged.

The liver was nearly always pale and congested with bile. The gall bladder was four times its normal size. The kidneys were very pale, and dropsical fluid was present in the fatty envelopes. In the case of the lungs, ingesta was found to have gained entrance through the trachea in two cases, and the lungs themselves were intensely congested. Through the occlusion of the bile duct, the portal system appeared to have been disorganized, and as a result all the organs of the body were congested. The stomachs appeared to have lost all tone and to be partially paralysed, and the omasum seemed to have acted as a trap through which neither food, gruel, nor medicine could pass. The rumen consequently became tremendously dilated, and the acorns remained in the stomach instead of being passed on. As a result of this condition of the rumen, regurgitation of the food took place, and some of it was got down into the trachea.

I must confess I have found acorn poisoning a most difficult ailment to treat, and have often thought of resorting to intertracheal injections of eserine, but have never quite liked to attempt it. I shall be greatly obliged if any of you will suggest a new and more successful treatment than the mere administering of medicines.

COWS AND WALNUT TREES.

By J. GOLD, M.R.C.V.S.
Redditch.

Indexed B. A. L.

On October 8, the writer was requested to see three cows; the animals were re-testers in a clean herd of 100 dairy cows, and they yielded to treatment much more quickly than in cases of acorn poisoning. He found the animals to be showing the following symptoms: Very dull in appearance, eyes very bloodshot, constipated bowels, champing of jaws, frothy saliva around mouth, and occasionally grinding teeth. When made to get up they appeared quite silly, and blundered about the yard and building, falling over, and showing symptoms of epilepsy. If left alone they lie quietly, but there was continued champing of jaws and twitching of eyes. One cow passed a little dung which was hard and covered with blood, and showed every condition

of paralysis of the bowels. Water was passed in very small quantities, and of a light blood colour. The whole of the cows strained after passing water, and this continued for about two days more or less. The cows had been turned out in an orchard which contained fruit trees—apples and pears—and also several walnut trees. The branches of three or four of these were low and within easy reach of the cows. Two of the cows were dry and lying off calving, and having one or two feeds per day, the same as ordinary cows. The third, a barren cow, was dry also. The cows were noticed to be eating not only at the branches and leaves of the walnut trees, but also the nuts and huds. The symptoms were certainly those of a form of narcosis. He was quite at a loss to know what the poison was in walnuts, and was still in the same uncertain state. The cows responded to treatment in the course of a few days, and as far as could be seen had made a perfect recovery.

The writer gave a good strong purgative in the first instance, consisting of salts and aloes, and followed up with the usual digestives, nux vomica, ammonia, and things of that sort. Except for what they obtained in the orchard, the three cows were fed in exactly the same way as from 95 to 115 others on the premises. The cows could have got nothing else but apples, pears, and the walnut trees, apart, of course, from the grass. He was strongly of opinion their condition was due to their having eaten walnuts.

DOUBLE-HEADED CALF (*DICEPHALUS MONAUCHENOS*).

By JOHN LINDSAY, M.A., M.D.
Glasgow Veterinary College.

The case occurred in the practice of Mr. William Robertson, M.R.C.V.S., Kirkintilloch. I am indebted to him for the specimen, and to Mr. Quentin Stewart, veterinary student, for procuring it for examination, and for the clinical data.

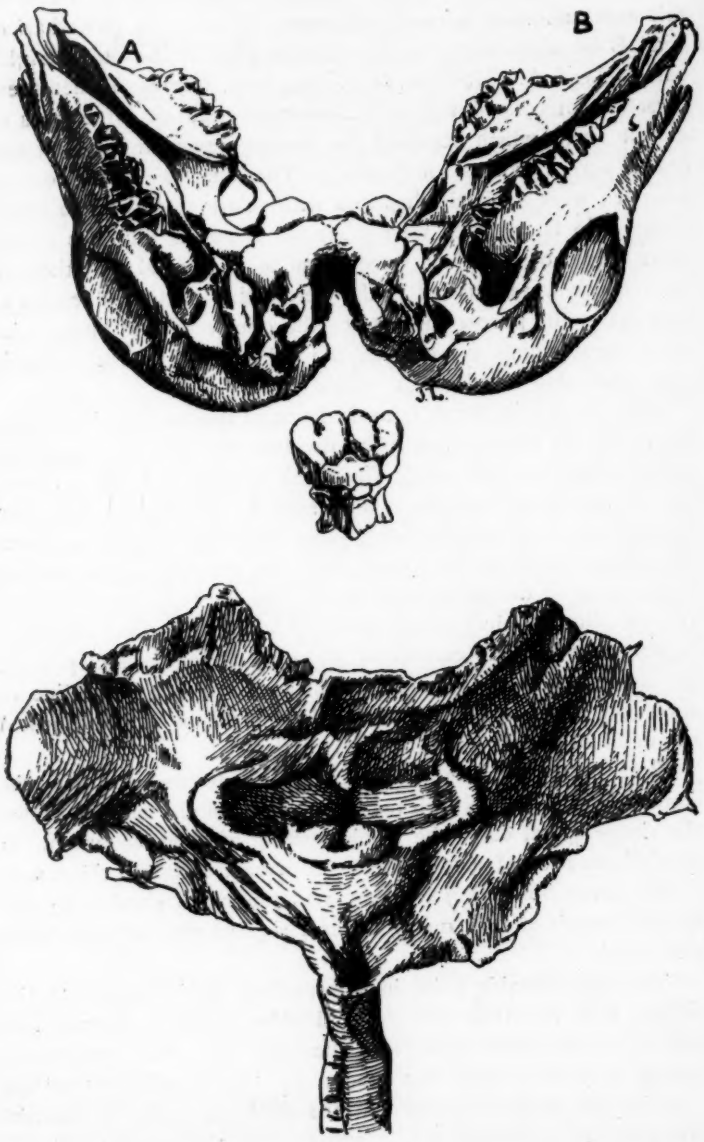
The monstrosity was from an old cow of the Ayrshire breed which had previously calved five times without any obstetrical or embryological abnormality. On this occasion the hind quarters presented and the body was born as far as the neck, when the heads were delivered by traction on the part of the farm hands without difficulty and before the arrival of the veterinary surgeon.

For brevity of description the head of the right side is called A; that of the left, B.

It will be observed from the figure that the long axes of the two heads make very nearly a right angle. It will also be observed that each face is bent on the cranium so that the plane of the hard palate meets that of the basis cranii at a wide angle. In both the palate was completely cleft. The halves of the face B were asymmetrical; while on the whole the skull B was smaller than A. There was complete bony union between the two through the fusion of a small part of the basilar portion of each occipital bone and of one border of their condylar portions on one side. Except that they were continuous where the missing condyles should have been the bones which entered into the union were normal in form and in their relations to neighbouring parts. The double skull had two condyles only, one belonging to A and one to B, and these articulated with a single atlas vertebra of perfectly normal size and configuration. The bridge of union was found to have been fractured. Even a comparatively slight force applied to the two muzzles would, by reason of the long leverage, have been easily sufficient to bring about the fracture. This doubtless occurred during parturition and made delivery possible.

Each of the two tongues had a complete hyoid apparatus articulated to the opposite sides of the single larynx. Each hyoid bone was perfect with all its processes, and each had a full complement of muscles. At the base of each tongue there was a well-formed epiglottis; but neither of these was effective in closing the single rima glottidis. The closure would be brought about, however, by the larynx being drawn up in swallowing, when a median ridge on the posterior wall of the pharynx, the septum nasi membranaceum, would exactly fit into the chink. Beginning dichotomy of the larynx was indicated by an additional pair of crico-thyroid muscles. A round, slender, but unidentified fasciculus of muscle fibres was attached by its ends to the bodies of the two hyoid bones. The œsophagus was single.

If the head of a calf were split from the lips to the foramen magnum, the cleft opened up and each half made a complete head by the addition of its counterpart within the cleft the conformation of this monster would be fairly reproduced. By such a mode of construction the muscles passing between the head


A
B

and the spine, and the thorax and fore limbs, would maintain their proper attachments and mutual relations. They did so in this case and were normally disposed, if the outer (left) half of head B be considered the true counterpart of the outer (right) half of head A. Had the dichotomy been carried further these muscles would no doubt have been duplicated out of a mass of muscle tissue which occupied the posterior part of the cleft and passed across from skull to skull. The muscles of the front of the neck were similarly disposed with relation to the two hyoid bones. So far as they were dissected the small muscles of the inner halves of each face were found to be normal; but the two ears, which were situated in the cleft, being partially blended at their base, the proper muscles of the one were continuous with the corresponding muscles of the other. The parotid glands here were also fused into a single mass.

A large arterial trunk lying in front of the trachea, but crossing it slightly from left to right, divided into two large branches and a middle smaller one. The trunk appeared a single vessel, but in transverse section it was seen to be divided into two channels by a septum extending from the bifurcation throughout the whole length of the vessel that was present in the severed head. One of the main branches formed the right carotid of A, and the other, the left carotid of B. The middle branch appeared to represent the left carotid of A; while a large vessel passing up the left side of the neck from an origin below the line of severance was disposed as the right carotid of B, and formed the main supply of the structures in the cleft.

Both brains were full sized, excellently formed and with the convolutions and sulci well marked. The medulla of each joined the single spinal cord, the whole making a T-shaped union. It would have been of special interest to have ascertained the course of the nerve fibres, but the part was too much crushed by the broken bone and torn up by hæmorrhage to warrant this being attempted.

The most notable point in the specimen as it appears to the writer, who has dissected many double monsters, human and animal, is the wide angle of dichotomy with the consequent abrupt transition from the single to the double formation. Usually the angle is acute and the doubling goes far beyond what the inexperienced would expect from the external appearance.

ACORN POISONING IN CATTLE.

By H. YEOMANS, M.R.C.V.S.
Kidderminster.

Indexed B. A. L.

During the last month or six weeks, practitioners in districts where oak trees were found had had many cases of acorn poisoning in cattle. In the writer's experience the symptoms in most cases had been as follows: The animal seemed heavy, depressed, and listless, with loss of appetite and cud; there was constipation, a doughy condition of the rumen on palpation, and grunts. In fact the symptoms were those of acute digestive disturbance. Later on the eyes had a sunken appearance, diarrhœa set in, the fæces being dark coloured, offensive, and blood stained. The temperature at first was normal, and later subnormal, and in fatal cases death took place in from about three to seven days.

Judging by the report of the number of deaths that had occurred recently, the treatment up to the present had not been so satisfactory as they could wish. He knew of no specific antidote, and his only reason for bringing the subject forward was that he hoped to gain some information from the discussion. The best results had been obtained by the early administration of a fairly large saline aperient combined with vegetable bitters, and followed by ant-acids, stimulants, &c., demulcent and nutrient drinks such as boiled linseed, new milk, &c. It certainly did seem that in those cases where the aperient was given early, the results were much better than when the practitioner was called in later on, as was too often the case.

Canine and Feline Clinicals.

URINARY DEPOSITS IN CATS.

By A. GOFTON, F.R.C.V.S.
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Urinary deposits in cats and the symptoms caused by their presence are scarcely mentioned in current literature and a note on a short series of seven cases which have recently been presented for examination and treatment seems worthy of record. The animals which formed the subject of observation were castrated males from 4 to 9 years of age. Five belonged to the Persian breed.

The information available when the animals were submitted for examination was very meagre; for two or three days previously they had been unwell, restless, apparently uncomfortable, mewing plaintively at times and taking little or no nourishment, except an occasional lap of milk. Observation and inquiry elicited the following particulars: The animals avoided lying and maintained a sitting or crouchng position; if nursed they would only remain still in a position in which the abdominal muscles were relaxed and with the hind quarters at a lower level than the fore. Movement was performed unwillingly, with the hind limbs drawn more or less under the body and the back arched; an erect posture was avoided as far as possible. The appearance was dejected and miserable, suggestive of pain and manipulation or movement produced plaintive mews. One cat had been observed straining and making fruitless efforts to empty the bladder or rectum and the owner stated positively that no urine had been passed for three days. With regard to a second animal, it was ascertained that a small amount of material in appearance closely resembling silver sand had been observed from time to time during the preceding three or four months at spots where the animal had been urinating, and some of this material was obtained for examination.

On palpation of the abdomen the bladder was easily recognized tensely distended, in size and shape resembling a large lemon and painful on manipulation. Its position was entirely abdominal and with the cat in a sitting or crouching position it encroached on the epigastric region. Its tenseness and firmness, its range of movement within the abdomen, and the distance of its posterior or caudal extremity from the entrance to the pelvis would be misleading if the condition had not been encountered previously. The first impression conveyed to the hand was that of a neoplasm or an abdominal abscess, but the pain on manipulation and the regularity of outline were against the former; the detection of the urethra attached like a pedicle to the bladder negatived the latter.

The preputial opening was more or less obstructed with hair wet and matted with mucoid-like material, amongst which a small amount of whitish gritty substance was observed. Some of the same material, so small in quantity, that it might easily have been overlooked, was present in the prepuce. When the penis

was pulled out with a pair of forceps, a cast of the moist, sandy material escaped or was removed from the urethra by pressure with the fingers. These casts were approximately estimated at ¼ to ¾ in. in length, and with one exception their removal cleared the urethral obstruction and the distended bladder was at once relieved easily by compression with the hand through the walls of the abdomen. No further deposit was detected in the urine which was collected. In all cases the obstruction was confined to the extra pelvic urethra, and in the exception referred to it was not possible, after amputation of the penis at the ischium, to remove the obstruction by means of a fine stiletto, either in a forward or backward direction, without tearing the urethra.

Three animals were in a moribund condition when admitted and died within a few hours. In the four which recovered a loss of tone amounting to almost complete inactivity of the muscular coat of the bladder was observed for a day or two, with retention of urine as a result. No real difficulty was encountered in relieving this condition by simple compression of the bladder with the hand, though a little "persuasion" was sometimes necessary before the flow of urine commenced. The diet was changed and small doses of tr. nucis vomicæ were administered for a few days until the bladder acted normally. So far as is known, no recurrence has taken place.

On *post-mortem* examination the bladder was observed, on opening the abdomen, to be dark red or nearly black in colour, and its walls thickened by the presence of a sero-sanguinolent fluid in the submucous tissue. The contained urine was clear. In no instance was a calculus present and no trace of the sandy-like material with which the urethra had been impacted could be detected within the bladder.

Chemical analysis of the deposit showed it to be composed entirely of phosphates.

These cases are too few in number to permit of any definite conclusions being drawn from them, but they present one or two points worthy of remark. First, with regard to the cause. It seems possible that the diet had an influence on the occurrence of the deposits. The animals were domestic pets and had little or no opportunity of going outside the house, where they were fed solely on fish and milk, and it is well known that fish is rich in phosphates. A change of diet by the substitution in part of meat for the fish would therefore appear to be appropriate.

The deposits appear to have small tendency to collect in the bladder in the form of calculi, and the history in one case makes it quite clear that phosphates may be passed intermittently in easily recognizable quantities for some time without giving rise to any apparent discomfort or disturbance of health. The deposits appear to pass without difficulty through the more capacious pelvic urethra, to be first arrested near the extremity of the penis, where the calibre and dilatability of the urethra is at its smallest.

In the event of failure to remove the obstruction by compression of the penis and urethra, these cases suggest the adoption of one of two courses. The obstruction may be relieved by incision of the urethra, a somewhat difficult task owing to its very small size, or the penis may be dissected from its attachments as far back as the ischium and amputated in that position. The latter is the more practical method, and after its completion a small canula or catheter can be passed easily into the bladder, or that organ may be relieved by simple compression with the hand.

DILATATION OF THE RECTUM IN THE FORM OF A SAC.

By CHARLES TAYLOR, M.R.C.V.S.
Nottingham,
AND
FRED HOBDAY, F.R.C.V.S.
Kensington, W.

The patient, a poodle, male, aged about 9 years, had been observed to have discomfort and difficulty in passing fæces during the previous three months. The dog would sit down and strain violently, eventually passing some fæces, but never a normal quantity. Enemas gave but temporary relief, and eventually a distinct swelling formed at the base of the anal region, slightly on the right side, about the size of half an orange.

Digital examination revealed this to be a sac containing fæces; the prostate was normal in size and no reason could be detected for the dilation. No operation or other measures being possible without more than temporary benefit, the dog was humanely destroyed.

PERMANENT COMMISSION OF THE INTERNATIONAL VETERINARY CONGRESSES.

A MEETING of the above Commission was held at Baden Baden on June 4, 1911, the following members being present: Lydtin (President), Hutyra, M'Fadyean, Degive, Tuleff, Happich, Hess, von Ratz, Kjerrulf, Locusteanu, Schimmel, Barrier, and de Jong (Secretary).

The agenda for the meeting included the following:—

(1) Minutes of the last meeting and report regarding the work of the Bureau.

(2) Information regarding the constitution of the Commission.

(3) Constitution of the Bureau.

(4) Communication of the views and resolutions of the Ninth Congress regarding the work of the Commission and of the Tenth Congress.

(5) Preparations for the Congress in London.

(6) Views and propositions of the members of the Commission.

The President, in opening the proceedings, mentioned that several members had wished a meeting of the Commission to be held the previous autumn, but the majority had preferred the period of Whit Monday. In any case it was desirable to meet in 1911 in order to bring definitely to a close the work of the preceding Congress at The Hague. Actually more than a third of the members of the Commission were present, and therefore any resolutions arrived at by the meeting would be valid. The President mentioned the names of members who had excused their absence, and referred in feeling terms to the loss of two honorary members of the Congress, viz., Professor Robert Koch and M. Arloing. He added that, as he was himself ill at the time, he had invited M. Arloing to represent the Commission at the ceremony commemorative of Professor Koch which was held in Berlin in December, 1910. Three months later M. Arloing, who was one of the Vice-Presidents, was himself removed by sudden death. In that case the President had represented the Commission at the funeral of their learned *confrère*.

At the jubilee of Professor Schütz Professor Hutyra, the Vice-President, had been good enough to represent the Commission, but unfortunately at the jubilee of Professor Dammann no member of the Bureau had been able to go to Hanover to represent them. The President had written to express the sympathy of the Commission with these celebrations.

In conclusion the President stated that in conformity with the statutes of the Commission he had been obliged to decline the request to organize an international congress on the occasion of the Congress of Hygiene at Dresden in 1911, and he added that the management of the baths at Baden Baden had placed at the disposal of the members present the right of admission to the *fêtes* to be held during the Whit Monday holidays.

Passing to the agenda for the day, the President informed the meeting regarding the steps which had been taken in France in order to obtain a worthy successor to M. Arloing. Although the

elections ought to be made by the future Congress, the Commission could make a provisional election, and the President was glad to be able to say that M. Barrier was the candidate put forward by the French Government and the French veterinary societies.

M. Barrier, having been elected by the Commission, received the congratulations of the President, and in returning thanks said that he would do everything in his power to further the work of the Commission. At the same time he conveyed to the meeting the salutations of M. Chauveau.

The President then requested the Secretary to read extracts from the minutes of the three preceding meetings.

M. Degive referred to a communication by M. Leclainche which had appeared in the *Revue Générale de Médecine Vétérinaire* regarding alleged irregularities on the part of the Permanent Commission and the organizers of the Congress at The Hague.

M. Barrier thought that too much importance ought not to be attached to the matter in question, because the communication represented only the personal opinion of M. Leclainche. M. Hutyra said that M. Leclainche's article had not been controverted, and he begged the Dutch members to offer some explanation.

M. de Jong said that the Executive Committee at The Hague had insisted on the acceptance of the regulations for the Congress *en bloc* at the opening meeting of the Congress, because without such approbation the Congress would have been working without any regulations. The Permanent Commission at first opposed this, as they wished the regulations to be considered at the closing meeting. In the end a practical solution had been found, the President consenting to accept the regulations provisionally at the opening meeting on condition that they should be afterwards discussed at the closing meeting of the Congress. All difficulties had thus been avoided. M. de Jong had written a letter of protest to M. Leclainche, who had replied that it was not his intention to accuse anyone, and that the passage in his article had been written with a special object.

The President thought that it was necessary to have regulations for the Congress at The Hague, and that the most practical method at the outset was to pass regulations with regard to the matter.

M. Degive put some categorical questions to M. Schimmel, and the replies of the latter decidedly negatived the view that there had been any irregularities.

Before entering on the discussion of the second subject on the agenda for the day the President said that the Permanent Commission and the Executive Committee were two different bodies, and that it was not necessary that one person should hold the office of secretary to both, although, by an accident, that was the case at The Hague. A divergence of views between these two bodies did not signify an absence of collaboration. At The Hague the Executive Committee had collaborated with the Permanent Commission, and it was the right and the duty

of the latter to offer useful criticism. He wished once more to take cognizance of the fact that at The Hague very valuable work had been done in the interests of the profession and of science. What had been done in that connection by the organizers of the Congress merited praise, and he took the opportunity to offer their thanks to MM. Schimmel and de Jong.

M. Schimmel thanked the Commission and also the President and Secretary.

M. de Jong also returned thanks, more especially to the President, who had always seconded his efforts in very difficult circumstances.

The Secretary read the list of the members of the Commission.

On the proposal of the President the third subject on the agenda for the day, viz., the election of the Bureau, was postponed until the afternoon sitting, and the Commission proceeded to consider the fourth subject, viz., the views and resolutions of the Ninth Congress. According to one of these resolutions the Commission had to consider the question of establishing an International Commission for dealing with tuberculosis in animals and eventually to formulate a proposal to the next Congress. The meeting thought it desirable to nominate a reporter to study the question, such reporter to have the right to confer with different specialists. M. de Jong was nominated reporter on the subject.

With regard to the Resolution Section I, III, 9 (disinfection of railway wagons), it was decided to appoint as a committee to consider the subject MM. Hess, Schnürer, and Ostertag, and M. Martel if M. Ostertag did not accept. The report of the meeting of the committee to be presented to the Congress in London.

Resolution Section V, I, 1 (regulations regarding over-sea transport of animals). The meeting appointed as a committee MM. Stockman, Rickmann, Hoogkamer, and van Es.

It was decided that the invitations to join these committees should be sent by the Secretary in the name of the President.

The other opinions and resolutions of the Ninth Congress which had a special interest for the Commission or for the future Congress had already been given effect to or they will appear in the programme of the Congress in London.

M. Hutyra expressed the opinion that at the Congress in London it would be desirable to avoid formulating conclusions which lost their value on account of their great length. He and M. von Ratz recommended the organizers of the London Congress to put on the programme only questions that were important.

M. Barrier wished to call attention to the difficulty which might arise in cases in which those who had been invited to act as reporters did not send in any report, and M. Hess referred to the inutility of allowing speeches of too great a length and of reports which did not treat of the question under consideration.

The President read a telegram from M. Piot excusing his absence, and another from the French Minister of The Hague announcing the name of M. Barrier as the French delegate.

At the afternoon sitting of the Commission the first business considered was the election of the Bureau. M. Lydtin, the President, intimated that on account of his age and the state of his health he did not wish to be proposed as a candidate. M. Degive, however, asserted that he was interpreting the views of all present in saying that it would be in the interests of the Congress and of the Commission to re-elect with unanimity their venerated and very active President. In view of the general applause with which this proposal was greeted, M. Lydtin agreed to accept the office of President, and thanked the members for their confidence.

M. Lydtin proposed as Vice-President M. Hutyra, who had already held this office, and whom he designated as his future successor. This was carried unanimously, and M. Hutyra returned thanks. The President had thought of M. Bang as second Vice-President in place of the late M. Arloing, but as M. Bang did not attend the meetings of the Commission he said that M. Degive appeared to be a very suitable candidate, and that perhaps M. Barrier, being French, was still better qualified to succeed M. Arloing. M. Degive advocated the election of M. Barrier, but the latter, while expressing his warm acknowledgments, said that he was the junior member, and M. Degive had the greater right to the office and would be a worthy Vice-President. He therefore proposed M. Degive, and this was carried unanimously.

M. de Jong was re-elected as Secretary, and M. von Ratz as Joint Secretary and Treasurer. Both of these gentlemen returned their thanks for the honour.

The President then called on Sir John M'Fadyean, who said that certain provisional arrangements with regard to the holding of the next Congress in London had already been made, and that it was his intention to have a meeting called at an early date at the Royal College of Veterinary Surgeons. The question of financing the Congress had been the subject of consideration, and it appeared probable that they would be able to raise the necessary funds. It was their intention to choose the subjects to be discussed at the Congress with every care, and in that connection they would bear in mind the suggestion which had been made by M. Hutyra. He desired to ascertain the views of the Commission as to what would be the most convenient time for holding the Congress. He suggested that the last week in July, which formed the close of the London season, would be the best, or alternatively, the first week in August. He thought that the month of September would be too late. With regard to the funds necessary to carry through the work of the Congress, he mentioned that they would not receive any Government subsidy, but, on the other hand, he believed that the members of the profession in Great Britain would subscribe liberally. The Commission resolved to fix provisionally the date of the Tenth Congress for the end of July or the beginning of August, 1914, and the President thanked Sir John M'Fadyean for the information which he had given them.

The President then called on M. de Jong, who wished to raise a question of much importance.

M. de Jong said that he spoke with considerable hesitation. He had hoped to be able to make in the interests of the Permanent Commission a proposal which would be warmly approved by all the members, but from what he had learned that day he feared that in that matter he was likely to be disappointed, and that perhaps it would be preferable to abstain from making the proposal which he had in mind. Nevertheless, he wished to make known to them the idea which had been formed at The Hague, and which had obtained the approval of His Excellency the Minister of Agriculture for the Netherlands.

The accounts of The Hague Congress would probably show a surplus of about 2,500 Dutch florins—a result which was due to an extraordinary subsidy which the Dutch Government had given to the Executive Committee, fearing that the ordinary grant would be insufficient. The idea had occurred to the Executive Committee at The Hague to take the necessary steps in order that this sum might be available for the Permanent Commission, and more especially for its Secretariat. The latter might be fixed at The Hague, following the example of the Permanent Commission of the International Medical Congresses. The Hague was becoming more and more the seat of international corporations, and it seemed to be in the interests of the organization of the Permanent Commission and of the International Congresses that the Secretariat and the archives should be located in some definite office and place. If the Government of the Netherlands were disposed to favour the idea of obtaining an office at The Hague, and at the same time the functions of a Secretariat, the Executive Committee of the Congress would probably have handed to them the surplus of 2,500 florins to be employed in paying the first cost of the installation of the Secretariat. All that would be in the interests of the Commission, which would then have obtained a special office for its Secretariat, while the latter would possess its own proper premises under the patronage of the Dutch Minister of Agriculture.

In reality, the Netherlands Minister of Agriculture was disposed to favour the idea, and he had authorized M. de Jong to say that if the Secretariat of the Permanent Commission were installed at The Hague His Excellency would give his patronage to it, and also to the meetings of the Commission in the event of these being sometimes held at The Hague. Subject to the same conditions, the Executive Committee of the Congress would place the sum of 2,500 florins at the disposal of the Permanent Commission.

The Minister would also put at the disposal of the Commission an office in which would be deposited its archives and its library, and in case of any meetings of the Commission being held at The Hague the necessary accommodation would also be provided. The Minister would also extend his patronage to the correspondence of the Commission if the latter required his support. But, apart from such support, the Commission would remain independent in its divisions and movements.

Unfortunately, although the initial proceedings in the matter had been taken some months previously, His Excellency's letter was not received until May 31, and thus had only been in possession of the Secretary for four days. There was, therefore, absolutely no time to have the question placed on the agenda. That, however, did not appear to be indispensable, in view of Article 13 of the Statutes of the Commission, which allowed them to consider propositions which were not included in the programme of the meeting provided they received the support of a third of the members present. The Secretary stated that he had that day communicated his idea on the subject to the President, and as a result of the conversation he had the honour to move the following propositions:—

(1) That the Permanent Commission approve of the formation of a Secretariat as a permanent institution, possessing its own office and funds, and, if necessary, its own staff.

(2) That the Commission accept the offer of the Executive Committee of The Hague Congress to employ the surplus from the Ninth Congress for the installation of the Secretariat at The Hague.

(3) That, subject to the approval of the Governments who have sent delegates to the Commission, the Commission accept the offer of the Minister of Agriculture for the Netherlands to patronize the installation of the Secretariat at The Hague, especially in the interests of international correspondence.

M. Barrier inquired whether in accepting the proposition the Commission would remain independent, and if the funds necessary for the correspondence would be at the disposal of the Commission. M. de Jong replied in the affirmative.

M. Hutyra, while recognizing the advantages of the proposition, thought that they could not deal with the matter since it had not been put on the agenda for the meeting. They had to consider three questions: (1) Whether it was necessary for the Commission to have a fixed office; (2) if so, in what town; and (3) if the Government who had sent delegates to the Commission would be in favour of the proposition. He himself had no authority from his Government on the question, and therefore he could not vote on the matter. He begged the Dutch delegates, in the first instance, to circulate their proposition to all the members of the Commission, after which the matter could be discussed.

In the course of the discussion which followed, MM. Hess, Kjerrulf, and M'Fadyean said that they also had no power to vote on the proposal, as they had received no definite mandate from their Government. M. Degive said that he was not quite clear as to what would be the consequences of the proposition.

M. de Jong was unable to understand the objections raised by M. Hutyra and others. He had not received the communication from his Minister until May 31, and therefore he had not been able to place the matter on the programme for the meeting. Moreover, it ought not to be forgotten that at Budapest the Commission itself had been created without any previous pro-

position, although none of the delegates had had any special mandate from their Governments. According to M. Hutyra's view, therefore, the Commission itself had been illegally founded. The special point, however, was that there was nothing to be feared and much to be hoped from the results of the present proposition. Owing to its situation The Hague was the seat of many international bodies, such as the International Court for Arbitration, with its Palace of Peace. It might be that if they did not accept the 2,500 florins the opportunity to obtain such a sum would not occur again, as the Executive Committee at The Hague would be obliged to divert it to another purpose, since it represented an *extraordinary subsidy*, separate from the ordinary funds of the Congress. The patronage of the Minister of Agriculture would be of great importance for the Commission. The Permanent Committee of the Medical Congresses had its Secretariat at The Hague, and it would be very regrettable if that Committee, which was their junior, took this step in advance of the Veterinary Committee. M. Locusteanu said that he saw no reason for hesitating, while M. von Ratz gave some information regarding the origin of the Permanent Committee of the Medical Congress. M. Schimmel was astonished at the unexpected opposition to a proposal which offered nothing but advantages. M. Barrier accepted the proposition of the Dutch members, because under it the Permanent Commission would remain entirely independent; he would not like to allow such an advantageous opportunity to pass, and he saw no good reason to refuse the generous offer of the Netherlands Government.

The President then put to the vote the question: "Is there any opposition to the formation of a fixed Secretariat?" The result was that seven members voted for a fixed Secretariat, four against it, and two members did not vote. M. Hutyra then brought forward his proposal that the question should not be considered until after notice had been given to all the members of the Commission. This motion was rejected—six voting for and seven against it. The President then put separately to the vote the three parts of the proposal of M. de Jong, with the following results:—

The first part was accepted by seven votes and six abstentions.

The second part was accepted by six votes and seven abstentions.

The third part was accepted by seven votes and six abstentions.

Thus the whole of the proposal was carried. Several of those who had abstained from voting declared that personally they were in favour of the proposal.

The programme of the meeting being now exhausted, the President thanked the members for their attendance, and the sitting came to a close after M. Barrier, on behalf of the members, had in very cordial terms thanked the President for his services in the chair.

DR. LYDTIN, *President.*
D. A. DE JONG, *Secretary.*

Abstract.

SNAKE-BITE AND ITS TREATMENT.*

So many cases of snake-bite have occurred during the last two months, two being fatal, that we think it advisable to republish an article on this subject which appeared in the December issue of this Journal, 1905, entitled "Snake-bite and its Treatment."

A correspondent has written suggesting that, in the interests of miners, some information should be given in the Journal concerning snake-bites and the best-known methods of treating them. It is an undoubted fact that men engaged in mining and in prospecting run great risk from snakes, both on the surface and in abandoned shafts, which often have to be re-opened; and, as such men are generally far removed from medical aid, it is well that they should know the best thing to do when anyone is bitten, and that the means to be adopted should be as clearly and widely made known as possible. Unfortunately, as far as internal remedies are concerned, investigations by competent authorities go to prove, as will be more fully explained later on, that to be armed with a reliable antidote is not nearly such a simple matter as the correspondent mentioned seems to think. He has been informed that the poison of the deaf adder acts on the nerves, while that of the black, brown, and other venomous snake acts on the blood; and suggests that the miner be made familiar with a specific for each class of bite of such a nature that he could be provided with it, and ready for any emergency. Dr. A. Muller, however, in his work on "Snake Poison: Its Action and its Antidote," came to the conclusion, after full investigation and experiment, that all snake venom is a nerve poison; but Professor Martin, who, when in Australia, also made a study of the subject, seems to draw some distinction, inasmuch as he refers to the futility of the generally accepted remedies to prevent the clotting of blood caused by all Australian snake poisons, except that of the deaf adder. Dr. Muller advocated the strychnine cure as a remedy in all cases of snake-bite; but, as he admits that it may be necessary at some stage of the treatment to administer strychnine in doses which, in the absence of the snake poison, would be fatal, it will be seen how dangerous it might be to try such a remedy without professional aid, even if later investigations had not considerably discredited —as indeed they have—this form of remedy. As to having the right antidote available, it is true that anti-venomous serum has been mentioned in this connection, but as one must apply the right antidote to the right snake, this remedy is hardly practical under ordinary conditions.

How to Distinguish Non-venomous from Venomous Snakes.

In cases of snake-bite, it is, of course, very important to determine whether the reptile inflicting the injury is venomous or not. Many persons have undergone much pain and often

* From *The Queensland Agricultural Journal.*

risk from heroic treatment for bites which they have supposed to be those of venomous snakes, but which a knowledge of the external characters of the different species would have shown to have been perfectly harmless. Indeed, it is believed that not a few persons bitten by harmless snakes have been killed either by fright or the treatment to which they have been subjected; while many records of recovery under certain treatment are unreliable on account of the doubt existing as to whether the reptiles inflicting the bites were really venomous.

As a matter of fact, far more of the Australian snakes are non-venomous than is generally supposed. The late Dr. Krefft, for many years Curator of the Australian Museum, Sydney, and a recognized authority on Australian snakes, describes twenty-one innocuous and forty-two venomous snakes of this country; but of the latter, he says, not more than five species are dangerous to man or the larger animals, and these retire underground for nearly five months of the year. The four Queensland snakes which are mostly to be dreaded are the deaf adder, the black snake, the brown snake, and the tiger snake. To the miner, prospector, and ordinary bushman, many opportunities are afforded of examining dead snakes; and, with a little observation and study, he might soon be able to tell at a glance the poisonous from the harmless species.

In the first place, on opening the mouth of a non-venomous snake, a row of small teeth will be seen along each jaw, and when such a snake bites he

. .
. .

leaves two rows of small punctures thus— . .
. .
. .

In the venomous snake these small teeth are rudimentary, and leave no marks; but towards the outer edge of the upper jaw there are two fangs, and the punctures left by the bite from these are two in number, thus— . . These fangs, which are the means by which the poison is conveyed from the snake to the person bitten, are not always in a state of projection, and it may be necessary to press the gum down with a stick or pen-knife before they can be seen; but this should be done with caution, and when it is certain the snake is dead. Sometimes, however, the punctures are not sufficiently distinct for them to be accepted as a reliable guide; but where the snake is seen there are other characteristics which will assist in the identification. According to Dr. Krefft, the gape of the mouth of the non-venomous Australian snake is usually curved upwards; while in the venomous it forms a straight line. Again, an important distinction is to be found in the labial (lip) scales. Dr. Krefft says that of the labials there are seven or more in non-venomous snakes, while in the venomous "there are generally only six (we may say always six—never more)." He adds that "it may safely be asserted that by these shields alone can the harmless or venomous character of snakes be ascertained. This rule does not apply to sea snakes, nor to blind snakes of the family *Typhlopidæ*,

but to Australian venomous and innocuous colubrine snakes only." Another distinctive mark is that in the non-venomous snake there is a loreal scale, which is absent in nearly all Australian snakes. This loreal scale is a supplementary scale which, in the non-venomous snake, is to be found on the cheek between a labial scale below and a frontal scale above, and between the ocular and nasal scales. In the venomous snake these four scales—the labial, frontal, ocular, and nasal—all unite at one point, and are not separated from each other, as in the harmless snake by the loreal scale.

The head and mouth characteristics which distinguish the two classes of reptiles can be seen at a glance from the accompanying reproduction of excellent photographs taken from nature by Dr. John Thomson, of Brisbane, who is a keen student of this subject, and who kindly placed his pictures and other useful information readily at our disposal for the purpose of this article.*

Dr. Thomson also has in his possession a diagram (in the shape of Fig. 2*) showing, in such a way that "he who runs may read," the chief distinguishing features between the venomous and harmless snake. This diagram, which was originally prepared to illustrate a lecture, should be cut out, and kept by persons in the bush in some place where it may be readily and often seen, so that its points may become impressed on the mind.

To Distinguish Venomous from Non-venomous Snakes by Head Characteristics (Krefft).

Venomous	Non-venomous
Gape of mouth straight	Gape of mouth curved, upwards
Labial scales, six	Labial scales, seven or more
Loreal scales, absent	Loreal scales, present
Bite marks . .	Bite marks . .

Dr. Krefft states that an Australian snake that is not thicker than a man's little finger, whatever may be its length, cannot by its bite endanger the life of an adult human being. It may be added that the true *fresh* water snake is always harmless, while the saltwater or sea snakes are always poisonous. Few of the tree snakes are venomous; while the carpet snake and the so-called "green snakes" are innocuous. Very often a thick woollen sock or stocking will prevent injury from the bite of a snake, as the fang may not penetrate sufficiently far for the poison which passes down its groove to be injected beneath the skin. There is a very widely accepted belief that the deaf adder inflicts injury by a *sting* from its tail, but this is not the case.

The general symptoms exhibited by persons bitten by a venomous snake are: Great anxiety, depression, and prostration, feeble and intermitting pulse, profuse cold sweats, vomiting, hurried respiration, indistinct speech, dilation of the pupil of the

* Not reproduced.

eye, drowsiness, and finally, in fatal cases, unconsciousness and convulsions.

TREATMENT OF SNAKE-BITE.

Professor Martin, late of the Melbourne University, who some time ago was appointed Director of the Lister School of Preventive Medicine in London, before leaving Melbourne, delivered a lecture embodying the results of several years of research into Australian snake poisons. The results of his investigations are somewhat disappointing as far as the generally accepted remedies are concerned. He says, that for all snakes except the deaf adder the only remedy that is of the slightest use is the ligature, applied immediately. He adds:—

"If the bite be on the tip of the finger, the ligature may be tied round the base of the finger, if done instantly. If not, we must go higher. It is no use tying anything round the wrist or fore-arm, nor round the leg below the knee, for in these places the limb consists of two bones, and the circulation cannot be stopped by a band of any sort. We must go above the elbow or above the knee, where there is only a single bone. The ligature must be tied as tight as possible—twisted tight with a stick—for no blood must pass. In half an hour's time the ligature may be removed.

"All the usual remedies, such as ammonia, strychnine, and chloride of lime injections, whisky, and exercise, are powerless to check the clotting of blood caused by all Australian snake poisons except the deaf adder. Cutting out the piece and gashing the limb to make it bleed is equally futile. Anti-venomous serum is a remedy, but hardly a practical one, as you must apply the right antidote to the right snake."

Other authorities do not go so far as Professor Martin with regard to scarifying the wound and administering stimulants, and, so far as they are not likely to be injurious, these means will probably continue to be followed as extra precautions. Dr. J. Ashburton Thompson, Chief Medical Officer of the Government Health Department of New South Wales, has issued specific directions for snake-bite treatment. He first advises the use of the ligature, which is to be loosened for five minutes after the first half-hour; then tied and screwed up again. At the end of the second half-hour the ligature may be removed altogether. Dr. Thompson, in continuing his directions, says: "In places where a ligature cannot be tied, as on the neck or face, pinch up the bitten part between the finger and thumb, and cut it out. In any case the bitten part should be cut into by numerous little cuts over and around the bite, for about 1½ in. round, and sucked by the mouth freely and perseveringly; and this can be done without danger by any person. Stimulants, such as brandy, whisky, gin, rum, in small quantities at a time (a few teaspoonfuls), or strong tea or coffee or wine, may be given if the patient be faint."

The removal of the ligature as described is a very necessary precaution, for at least one case has occurred in Queensland where, through keeping it on too long, mortification set in, and amputation of the arm had to be resorted to.

Professor Krefft, in his work previously referred to, says: "The whole treatment resolves itself into this: *Suck the wound, if possible, at once; apply a ligature; lacerate the punctures, and wash the part with water or urine; keep moving, and do not despond.* Half the number of fatal cases have resulted from fear, many persons having died simply because they lost heart, did not attempt to tie a ligature, or were afraid to lacerate the wound and suck it."

A Croydon paper some time ago published particulars of a case in which a cure had been effected by rubbing vinegar into the wound; but in this case the ligature was first applied and the wound scarified. The vinegar was used in consequence of the person treating the patient having seen an extract in the *Queensland Agricultural Journal* from an Indian paper, which described experiments successfully made with it on animals which had been bitten by snakes.

Mr. John Wilson, Brisbane, says that in Ceylon he was very successful in saving the lives of coolies who were bitten by cobras or tic-polangas when picking coffee. As soon as a man was bitten, a ligature was put on above the wound, then a pin was pushed through the skin, a piece of twine was twisted round the projecting part of the pin and drawn tight. This raised the bitten part, which was cut off with a sharp knife.

The vinegar cure is described in the *Queensland Agricultural Journal* in the issues of January, 1903, January, 1904, and February, 1905. Three authenticated cases of cure of snake-bite by the vinegar treatment have been reported to us since the first article appeared in the Journal.

UNIVERSITY OF LONDON.

Boards of Studies for 1912.

The Boards of Studies have been constituted for 1912 as follows:—

[*Note.*—* signifies "Appointed Teacher of the University."]

XXXIV.—Veterinary Science.

(a) Teachers of the University.

Professor G. A. Buckmaster, University College and Royal Veterinary College.
Professor T. W. Cave, South-Eastern Agricultural College.
Mr. M. J. R. Dunstan, South-Eastern Agricultural College.
*Professor W. D. Halliburton, King's College.
Professor G. D. Lander, Royal Veterinary College.
Professor Sir John McFadyean, Royal Veterinary College.
Mr. E. S. Shave, Royal Veterinary College.
Professor H. W. M. Tims, Bedford College and Royal Veterinary College.
Mr. G. H. Wooldridge, Royal Veterinary College.

(b) Other Persons.

Mr. W. Hunting, Mr. S. Stockman.

PRELIMINARY EXAMINATION IN VETERINARY SCIENCE FOR INTERNAL AND EXTERNAL STUDENTS.

PASS LIST, *December*, 1911.

201. Lalor, Alfred Gordon Eggleston, Royal Veterinary College.

Examiners: Inorganic Chemistry: J. A. Gardner, Esq., M.A.; Professor H. Jackson, F.C.S.; J. E. Marsh, Esq., M.A., F.R.S.; and John Wade, Esq., D.Sc. Physics: J. H. Brinkworth, Esq., B.Sc.; G. W. C. Kaye, Esq., D.Sc., B.A.; A. W. Porter, Esq, B.Sc.; and Professor Frederick Womack, M.B., B.Sc.

FACULTY OF SCIENCE (VETERINARY SCIENCE) GENERAL INTERMEDIATE EXAMINATION (PART I) FOR INTERNAL STUDENTS.

PASS LIST, *December*, 1911.

251. Grey, Gerald Omar Rushie, Royal Veterinary College.
252. Hancock, Reginald Cuthbert Greatrex, Royal Veterinary College.
253. Marais, Guillaume François, Royal Veterinary College.

Examiners: Organic Chemistry: J. A. Gardner, Esq.; J. E. Marsh, Esq.; H. Jackson, Esq.; John Wade, Esq.

THE ROYAL SANITARY INSTITUTE.

YORK CONGRESS AND EXHIBITION, 1912.

A PUBLIC meeting to inaugurate arrangements for the Congress and Exhibition of the Institute, to be held at York from July 29 to August 3, 1912, was convened by the Lord Mayor of York, in the Mansion House, on Wednesday, January 10, at 3 p.m.

President of the Congress.—The Most Rev. His Grace the Lord Archbishop of York.

Officers of Sections and Conferences.

Veterinary Inspectors.—President: Professor J. R. U. Dewar, F.R.C.V.S. Recording Secretary: J. A. Dixon. M.R.C.V.S., Veterinary Inspector, Leeds.

U.S. DEPARTMENT OF AGRICULTURE, BUREAU OF ANIMAL INDUSTRY (Circular 150A).

A. D. MELVIN, CHIEF OF BUREAU.

LIST OF ACCREDITED VETERINARY COLLEGES.

Revision of List contained in Regulation XXIV, Bureau of Animal Industry Circular 150, "Regulations Governing Entrance to the Veterinary Inspector Examination."

THE following list of accredited veterinary colleges, graduates of which are eligible for the Civil Service examination for the

position of veterinary inspector in the United States Department of Agriculture, Bureau of Animal Industry, is hereby approved in lieu of that published in Regulation XXIV of Bureau of Animal Industry Circular 150, "Regulations Governing Entrance to the Veterinary Inspector Examination"*:—

Alabama Polytechnic Institute, College of Veterinary Medicine.
Chicago Veterinary College.
Cincinnati Veterinary College.
Colorado State College, Division of Veterinary Science.
George Washington University, College of Veterinary Medicine.
Grand Rapids Veterinary College.†
Indiana Veterinary College.
Iowa State College, Division of Veterinary Medicine.
Kansas City Veterinary College.
Kansas State Agricultural College, Veterinary Department.
McKillip Veterinary College.
New York-American Veterinary College.
New York State Veterinary College.
Ohio State University, College of Veterinary Medicine.
San Francisco Veterinary College.
State College of Washington, Veterinary Department.
University of Pennsylvania, School of Veterinary Medicine.
University of Toronto, Ontario Veterinary College, to include only those graduated during or prior to 1897.

Graduates of the following named colleges which are not now in session will be admitted to examinations:—

Columbian University, Veterinary School, Washington, D.C.
Harvard University, School of Veterinary Medicine, Boston, Mass.
McGill University, Veterinary Department, Montreal, Canada.
National Veterinary College, Washington, D.C.

Graduates of the following named foreign colleges will be admitted to examinations:—

Glasgow Veterinary College, Glasgow, Scotland.
Royal Veterinary College, London, England.
Royal Veterinary College of Ireland, Dublin, Ireland.
Royal (Dick) Veterinary College, Edinburgh, Scotland.
The New Veterinary College, Liverpool, England.
Veterinary College of Lemberg, Austria.

Approved. JAMES WILSON,
Secretary of Agriculture.

Approved (by direction of the Civil Service Commission).
JOHN C. BLACK,
President.

Washington, D.C., *August* 22, 1911.

* This list is subject to change. The failure of any college to comply with the provisions of the regulations will necessitate removal from the list.

† To include only those graduates who have pursued the study of veterinary medicine at this college or in some other accredited college for three years.

Reviews.

NOTES ON THE INDIGENOUS CATTLE OF THE UNITED PROVINCES.

WE have received a small brochure on the breeds of Indian cattle, containing notes on the indigenous cattle of the United Provinces, by Mr. E. W. Oliver, M.R.C.V.S., F.Z.S., Superintendent of the Indian Civil Veterinary Department, United Provinces, and with additional notes contributed by Mr. C. W. Wilson, M.R.C.V.S., the Second Superintendent of the Civil Veterinary Department. It is a comprehensive little work on the breeds, rearing, management, prices, working and milking capacity, and other details of these animals, and will be of value to those interested in Indian cattle. It contains seventeen excellent illustrations, and is published by F. Luker, Superintendent Government Press, United Provinces, Allahabad.

"LA VIE AGRICOLE ET RURALE." Published weekly in Paris by Baillière et Fils, Paris. Price, 25 cents.

THIS weekly journal, which is published in Paris, is intended to supply farmers and others with useful and up-to-date information connected with subjects of rural life in which they are interested. The names of many of the best well-known men in the scientific pursuit of agriculture are inserted amongst the contributors and subscribers, and the articles of the number for the last week of December contain valuable information (with illustrations) upon the culture of maize, various breeds of sheep, the use of the motor in cultivating the land and harvesting, and even on the question of the necessity for keeping up a pure-bred race of sheep-dog and the dangers to be feared by foreign importations. Abstracts from English and other agricultural journals are given, the current market prices are set forth in detail, and altogether, for those interested in agricultural subjects, the paper is full of information.

TUBERCULOSIS. A plain statement of facts regarding the disease, prepared especially for farmers by the International Commission on the Control of Bovine Tuberculosis. Published by the Government Printing Bureau, Ottawa, Canada.

IN a small, but excellently illustrated, brochure of some thirty pages, Dr. James Rutherford, C.M.G., F.R.C.V.S., has set forth in simple language intended for the benefit of farmers, the chief symptoms and dangers of the presence of tuberculosis in a herd, together with the best way of eradicating it. The illustrations in particular are excellent, and more than anything else demonstrate clearly the folly of attempting to decide upon external appearances alone the presence or absence of tuberculosis in a beast.

The discovery of the value of the tuberculin test placed a new weapon in the hands of the trained veterinarian, and why it is not universally used to cleanse our herds of disease seems quite unintelligible except on grounds of expense.

REPORT OF THE VETERINARY DIRECTOR-GENERAL OF THE DEPARTMENT OF AGRICULTURE OF CANADA FOR 1910. Published 1911 by the Government Printing Offices, Ottawa.

To all veterinarians the Report of the Director-General of the Department of Agriculture, Dr. Jas. Rutherford, C.M.G., F.R.C.V.S., and his able assistants, proves most interesting. It illustrates very clearly the good work which is being done by members of our profession in Canada, and ably shows the necessity that a scientific control of disease is essential for the prosperity of agriculture.

Glanders, anthrax, maladie-du-coit, to mention only three of the scheduled diseases, would soon devastate the studs and herds of a country if allowed to go unchecked, and these, we read, are now by no means giving rise to any serious alarm.

Mange, both in horses and cattle, is diminishing, and sheep-scab has entirely disappeared. An extensive outbreak of rabies in Ontario had to be repressed by drastic measures, and the difficulties of dealing with anything of this kind in a country like Canada are enormous. If ever, as Dr. Rutherford remarks, it got a foothold amongst the wild animals of Northern Canada, it is probable that it never would be completely stamped out.

The book is prepared and summarized by Dr. Rutherford, and his staff give elaborate reports, each upon his own individual speciality, in detail.

It can be obtained from the Government Department by any qualified veterinarian upon application.

Translations.

EXAMINATION OF THE URINE AS AN ACCESSORY MEANS OF DIAGNOSIS FOR FOREIGN BODIES IN CATTLE.

BY NEIDIGER.

THE author lives among a *clientèle* in an industrial neighbourhood whose principal trade consists in the manufacture of wood fibre, which is put up in bales bound with wire thread; he attributes to this fact the large number of foreign bodies and fragments of wire which he meets with in cattle. In order to facilitate diagnosis of these affections, he calls to mind that the greater part of the time the penetration of a foreign body into the organism of ruminants is accompanied by a localized or generalized peritonitis, and that this interprets itself by the presence of albumen in the urine.

Out of a total of thirty-two cases examined, Neidiger established the presence of albumen in the urine in twenty-eight instances, and at the autopsy has confirmed the diagnosis of peritonitis due to a foreign body. Four times, however, the researches have been negative. Urinary analysis, without being infallible, helps to confirm a diagnosis, and from this point of view presents some clinical interest.

(*Oesterreichische Woch. für Tierheilkunde.*)

INFECTIOUS NODULAR VAGINITIS OF COWS, AND ANALOGOUS ALTERATIONS ON THE MUCOUS MEMBRANE OF THE PENIS OF BULLS.

Indexed B. A. L.

By Professor NENCIONI.

Numerous articles have been devoted to contagious vaginitis, especially since the discovery of the *Streptococcus vaginalis* of Hecker and Ostertag.

Raebiger has recently shown that bulls may be infected and develop orchitis with specific preputial catarrh. The present work is concerned with a study of the lesions of the penis. Specimens have been furnished by an infected bull, presenting yellowish or reddish spots on the mucosa of the penis, especially apparent in the posterior region and well defined and large in the mucosa of the prepuce. The animal was slaughtered and the infected organ immediately removed. The mucosa showed nodules as large, or larger, than a millet seed, projecting or sunken. On the prepuce they formed by their confluence a granular carpet. Some were hard, others soft; their surface shiny or opaque; almost always greyish white in the centre, and surrounded by a red, depressed circle. Some nodules represented vesicles filled with a turbid liquid, but never purulent.

Histological examination, after fixation by the use of alcohol and xylol, and staining by Delafield's hæmatoxylin and eosine, or Nicolle's phenyl thionine and van Gieson's mixture, showed that the nodules were situated in the sub-mucous connective tissue under the stratified epithelium, pushing up without compressing the papillary body. The nodules consist of a mass of round cells chiefly lymphocytes; some have a softening or necrotic centre. The vessels were infiltrated at their periphery with leucocytes, their walls and endothelium were intact. These lesions are identical with those which have been described by Thorns in the vagina and by Pomayer on the clitoris of infected cows. One may describe the affection under the name of nodular streptococcic infection of the mucosa of the penis of bulls contaminated by cows affected with nodular vaginitis.

(*Il nuovo Ercolani.*)

THE METHOD OF BIER IN VETERINARY MEDICINE.

By LEMINE and DUCROTOY.

The method is employed in the form of passive and mixed hyperæmia.

Passive or venous hyperæmia, employed by the authors in 74 cases, is obtained with the elastic bandage "furnished by the military hospitals for surgical hæmostasis," measuring 6 centimetres in width and a millimetre in thickness, or with "a soft and simple elastic bandage." These bandages are of a length varying with the region to be treated. They ought to be 2 metres

(6½ ft.) for the neck; a metre (3¼ ft.) for the inferior half of the leg or fore-arm; and a little over 2 ft. for the cannons. In order to apply them, "one holds the commencing end with one's left hand, or has it held by an assistant, and makes successive turns round the limb with the bandage," one imbricates it, "putting it on slightly obliquely to the axis of the limb and exercising a moderate traction on it. The extremity is pinned or fastened with a clip, or the end is tacked under the last turn of the bandage. The total of surface impressed ought to be about three times the width of the bandage."

The constriction exercised ought to be painless, and to uniformly hinder the return circulation. It is appreciated by the introduction of the index finger between the bandage and the skin, the temperature of the region rendered hyperæmic, the state of the pulse below the bandage, the dimensions of the œdema provoked, and, if the compression is excessive, by the appearance of general symptoms recalling those which horses affected with colic present. The duration of the application of the bandage is subordinated to the amelioration of the symptoms. The number and duration of the stasis proceedings cannot be precisely indicated; identical results are obtained with variable durations. In general the stases are from six to twelve hours. The first applications, often of decisive import, ought to be "as regular and as equal in length of time as possible."

The bandage should be fixed in such a manner as not only to comprise in the hyperæmia the affected parts, but also the healthy surrounding parts; it ought never to be in contact with inflamed tissues. The places of choice for its application in the horse are: The inferior half of the fore-arm and leg, the cannon in its superior part, and the neck immediately below the larynx. It ought to be put on at the same place on each occasion during the whole length of the treatment. Cutaneous wounds are avoided (knee and hock) in exposed regions by interposition of a piece of wadding between the skin and the elastic bandage. If they occur, the bandage is displaced or the duration of the compression diminished.

Mixed or arterio-venous hyperæmia is obtained by the employment of cupping glasses. These act by the local and deep congestion they produce, as well as by the mechanical disinfection they occasion. The cupping glass most used is a wooden one with thick edges, in which the air is rarefied by combustion of a little alcohol, wadding, or other inflammable material. The technique is very simple: "After having carefully shaved and damped the skin with warm water, the glass is rapidly applied, taking care that the whole of its circular border is in contact." In regions where the skin is little mobile or deprived of inflammatory tumefaction the adherence of the glass is facilitated by depositing a fat body on its edge or by the creation of artificial engorgement by means of an elastic bandage placed for one or two hours below and far enough away from the lesion. Each aspiration ought not to last more than five minutes; it ought to be followed by a rest of equal duration. The applications can

be renewed several times consecutively; their number is subordinated to the gravity of the symptoms observed. To withdraw the cupping glass, it suffices to invert it at the side, depressing the skin with the fingers at the point of the circumference. Cupping glasses ought to be especially used in treatment of grave contused and penetrating wounds, in synovitis, arthritis, abscesses, cysts, inexhaustible fistulas, &c. They are contra-indicated in serous discharges of traumatic origin.

(*Bulletin de la Société Centrale de Médecine Vétérinaire.*)

ON THE TREATMENT OF ANASARCA IN THE HORSE BY ADRENALIN.

By SCHLAMPP.

Different drugs proposed up to now for use against anasarca have not given satisfying results. It was logical to try vaso-constrictors, but extracts of hydrastis and preparations with ergot of rye as a base are without action. Schlampp has utilized adrenalin, whose employment had already been extolled by Payrou in 1906, but he has given it in subcutaneous injections, and not by the mouth. He inoculated under the skin 2—4 c.c. (= 2—4 mg. of adrenalin) of the solution adrenalin hydrochloride and Takamine, and repeated the inoculations daily for several days. There was no local reaction. In twelve to eighteen hours the fever declined from 40°—40.7° C. to normal, and remained down for two days at least. Petechiæ and œdemas seemed to be absorbed rapidly, especially the former. The first results obtained are clearly favourable.

(*Münchener Tierärztliche Wochenschrift.*)

POISONING OF CATTLE BY INGESTION OF SEA-WATER.

Indexed B. A. I.

By REIMERS.

In a very low meadow situated near the mouth of the Elbe and which had been inundated some time previously by sea-water, 51 out of a total of 300 cattle died. The surviving ones remained recumbent, somnolent; they got up with difficulty; their gait was weak and tottering. In all of them there was profuse diarrhœa. At the autopsy lesions of gastro-enteritis were chiefly noticed, most markedly evident at the rectum; the liver was citron yellow.

The affection evolved in three to fifteen days. It spread rapidly, and disappeared when the sick animals were put into a meadow which had not been inundated.

The animals were intoxicated by drinking briny water remaining in the hollows of the ground—they had no other drink at their disposal. The herbage also was very strongly salted.

(*Berliner Tierärztliche Wochenschrift.*)

RESEARCHES CONCERNING A LACTESCENT ASCITIC LIQUID.

By Messieurs POENARU and C. I. GEORGESCO.

We have been able to extract 700 grm. of a lactescent liquid, having the appearance of milk of the best quality, from a cat affected with ascites. At the examination, however, we discovered a large quantity of polynuclear granular leucocytes, having the aspect of globules of pus, a few mononuclear leucocytes, some desquamative cells, and red globules.

On microscopic examination of a drop of the lactescent liquid we found fine granulations of fat and other greasy spheres of a larger size produced by fusion of small granules. Lactescent accumulations are very rare in human medicine; they are quite exceptional in veterinary medicine, and almost unknown in cats.

According to certain authors the lactescence is due to granules of fat derived from fatty degeneration of the peritoneal endothelial cells, as the result of a toxic substance probably contained in the liquid discharged. From an etiological point of view we have made microscopical investigations on the centrifugalized deposit of the liquid, with the view of convincing ourselves that we were acting in the presence of a peritoneal tuberculosis. The results, however, have been negative.

Knowing from human medicine that chylous ascites of hot countries can be due to filariasis causing rupture of the lymphatic vessels and dilation of the chyliferous ones, we examined the blood by day and night on several occasions. However, in no preparation did we find embryos of filaria.

During one month the examination of the blood and the liquid was made regularly, not only from the point of view of parasites which are sometimes found in these liquids, but, above all, from the point of view of the different pathogenic microbes. The cat got gradually thinner day by day, and arrived at a veritable state of cachexia.

The chemical composition of the fluid, given from the chemical laboratory of the Mayor of Bucharest, was as follows: Colour, lactescent white; consistence, fluid; reaction, slightly acid (lactic acid, .04); specific weight, 1.0162; dry extract 105° C., 6.59; water, 83.41; mineral substances, 1.20; fat, 1.80; albumen, 3.60; lactose (galactose), none; free extract of fat, 4.7.

It is proved, according to this examination, that this liquid did not contain sugar under the form of lactose, one more further proof that galactose is formed in the mammæ.

Intra-peritoneal inoculations, made with 5 c.c. of lactescent liquid, on two rabbits and two guinea-pigs did not produce the disease. Only the two rabbits died, one with severe coccidiosis of the liver and the other with fatty degeneration of the liver.

Cultures made on different media, aerobic and anaerobic, remained sterile. The urine contained neither albumin nor *cylinders*. The number of red globules was 2,300,000 per c.mm.; that of the white globules 11,000 per c.mm.

At the autopsy of the cat we found the following lesions:

The muscles almost pulpy, the fatty tissue entirely disappeared, the lungs strewn with little nodules, in part calcified and œdematous. The heart was dilated, and in the right auricle whitish spots could be seen, a true fatty degeneration, with calcareous infiltrations. On the mucosa of the stomach pepsic ulcers could be seen. The liver was increased in volume, and its lobes were narrowed in several places by some neoformations of perihepatitis.

The gall bladder was dilated, and on its interior was a multitude of coccidiæ.

The spleen was increased in size and lobulated by some neoformations of perisplenitis. The peritoneum was affected with chronic peritonitis. On the intestines connective fibrous neoformations were found. The glands were increased in size; coccidiæ were found in them by microscopic examination.

The kidneys were congested; the pancreas enlarged, and likewise the suprarenal capsules.

Nothing abnormal in the thoracic canal; the mesenteric lymphatic vessels were, however, dilated.

From our investigations we concluded that the lactescent ascites was directly due to coccidiosis, which had affected almost every organ; in certain viscera the nodules were calcified, *e.g.*, the lungs and heart, whilst in the liver and the glands they were non-calcified.

It is possible the coccidiæ had played a mechanical *rôle* with regard to the lymphatic vessels, and that, as in filariosis, having dilated and even torn them, they had produced a chylous discharge into the peritoneum.

As for the stomachal ulcers, one can ascribe them to parasitic emboli, contributing thus to necrosis of the mucosa and its subsequent digestion by the gastric juice.

(*Arhiva Veterinara.*)

A CASE OF CHRONIC PNEUMONIA AND COMMENCING BROKEN WIND.

By M. H. PERRIN,
Retired Chief Veterinary Surgeon.

In the *Répertoire de Police Sanitaire Vétérinaire* of November 15, 1910, I recorded a case of infectious pneumonia which I had treated during the year, and which could be considered as resulting from the inundations of the Seine which took place about Paris during the winter. I made known the basis of the treatment employed:—

Camphorated phenol	... ...	āā 10 grm.
Acid salicyl.	... ...	2 grm.
Essence of eucalyptus	... ...	2 grm.

This was administered as an electuary, or given as a drink in coffee, three or four times a day, according to the gravity of the case. This treatment had succeeded many times with me, but on this occasion gave me my only failure.

All these sick horses, seen by me afterwards, appeared to be in good health and radically cured. One, only more gravely affected than the rest—double broncho-pneumonia—was ill for a long time, and had a prolonged convalescence. Nevertheless, when put to work, this horse (a Percheron, 7 years old) showed himself little apt for his work, was easily fatigued, started blowing and sweating; he was falling away in condition, slightly emaciated, appetite bad, nutrition disturbed, coat dull and staring; now and then a cough was heard, having nothing characteristic, not wheezy, not often repeated, without discharge. An attentive examination of the respiratory movements enabled a double expiration to be seen; auscultation no more than percussion enlightened me; no hyperthermia; frequent and abundant urination; pressure over the kidney region showed increased sensibility; some pulmonary alteration evidently remained, and there was a suspicion of commencing broken wind.

This state persisting, in spite of different changes of food and medicine, I finally had recourse to the employment of vergotinin, which I had used previously with good effect in analogous cases. Vergotinin makes the appetite return promptly; it is a good stimulant of the digestive functions, rendering feeding profitable, increasing nutrition, and giving strength to the animal, endurance for work, and renewing the exhausted nervous system. Emaciation in this case disappeared quickly; the eye became lustrous, the coat shining, the cough was heard no more, the respiratory rhythm became regular, the animal no longer blew at his work, and gradually regained his past vigour; at the end of a month he had quite recovered his normal state.

(*Revue Générale de Médecine Vétérinaire.*)

Letters and Communications, &c.

Mr. L. E. W. Bevan; Professor Gofton; Mr. J. B. Buxton; Registrar of London University; Secretary of the R.C.V.S.; Secretary, Royal Sanitary Institute; Dr. Rutherford; Dr. van Es.

Books and Periodicals, &c., Received.

Bulletin of the Bureau of Sleeping Sickness; Report of the Director-General of Department of Agriculture of Canada; Tuberculosis, by Dr. Rutherford; Swamp Fever in Horses, by Dr. van Es: Notes on Indigenous Cattle of the United Provinces, by E. W. Oliver; Journal of the R.A.M.C.; Agricultural Journal for the Union of South Africa; Rhodesian Agricultural Journal: London University Gazette; Proceedings of the Royal Society of Medicine.

NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

Letters for the JOURNAL, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editors.

Manuscript—preferably type-written—should be on one side only of paper, marked with full name of author.

Illustrations for reproduction should be in good black or dark brown on white paper or card.

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